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ERRATA

The pages in this issue should be numbered 1 to 46. Through an error, the paging was continued without interruption from Volume III. The February issue will begin with page 47 and note will be made of the error in pagination in the annual index. We hope that our readers will pardon this oversight on the part of the printers.

THE PUBLISHER

THE AMERICAN JOURNAL OF ROENTGENOLOGY

Editor, James T. Case, M.D., Battle Creek, Mich.

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ROENTGENOLOGICAL TREATMENT OF 530 CASES OF MALIGNANT AND OTHER TUMORS OF THE FACE*

BY H. W. DACHTLER

TOLEDO, OHIO.

THE object of this paper is to present the statistical and other results of 530 cases of tumors of the face, lips and neck, roentgenologically treated during the past sixteen years, sixty-two per cent. of the cases being diagnosed as malignant. Although no microscopical examinations were made, long clinical experience confers on the operator the ability of diagnosing these cases with a high degree of accuracy.

Good cosmetic results being of great importance in the regions described, a comparison of the results of roentgen therapy with those obtained by other methods will be both interesting and instructive.

Of the total of 530 cases, 157 cases treated in conjunction with Dr. E. D. Tucker have been previously reported,[1] but carcinoma of the neck has not been included in these statistics.

All the cases forming the subject of this report had existed for some months, and many of them were precancerous or had resisted treatment by other methods. All of them belonged to the type that demands destruction of the growth, while less dangerous lesions which were treated by Dr. Tucker are not considered here.

Many of the cases presented malignant conditions involving the eyelids which, in the early part of the sixteen years over which this report extends, could not be treated by the common destructive methods without danger to the eye, nor were they suitable for surgery. Hence there is a higher percentage of this class of cases than is observed at the present time.

Another point is that in the earlier years it was not customary to refer cases with lesions of the nose, ear or cheek to the roentgenologist until repeated attempts at destroying them by cautery had failed and they were shown to be distinctly malignant in character. At the present time, the cases are referred earlier because physicians have become more convinced of the efficacy of the roentgen method of treatment. Again, more patients consult the roentgenologist direct at the instigation of other patients.

In the absence of a microscopical diagnosis I have divided the cases according to the area involved:

[1] Meeting of the Ohio State Medical Society, 1910.

* Read at the Seventeenth Annual Meeting of the American Roentgen Ray Society, Chicago, Ill., Sept. 27-30, 1916.

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	Males	*Females*	*Total*	*Cured*
Eyelids	98	47	145	134
Nose	61	49	110	102
Cheek	60	35	95	81
Lower Lip	55	2	57	52
Forehead	17	27	44	43
Ear	22	3	25	20
Upper Lip	12	6	18	16
Chin	6	2	8	8
Neck	7	—	7	7
Keloids	8	3	11	11
Lupus	3	4	7	3
Erythematous Lupus	—	3	3	—
Total	349	181	530	477

One of the most favorable locations, so far as effective treatment is concerned, was the forehead, there being but one failure in seventeen cases. Among these was one female patient who, having received fifty-two roentgen applications elsewhere, could only be persuaded with difficulty to consent to another trial. A cure, however, was effected with eight exposures. This was eight years ago, and there has been no recurrence.

All the cases involving the chin (8) were cured, there having been no recurrence for two years which have elapsed since the operation. There has been no other chin case since.

There were seven cases involving the neck which looked rather ugly, but they proved to be of the fungating type and cleared up rapidly. Possibly some of these might have been shown to be granuloma or at all events non-malignant, but as there might have been danger of early glandular involvement, all had energetic treatment and there have been no recurrences.

Of 18 cases involving the upper lip, 16 were cured. One patient, becoming discouraged, had the growth removed with paste, and another discontinued treatment and was lost sight of. No recurrences have taken place in the cured cases.

Of 110 cases affecting the nose, 102 were cured. Three of the unsuccessful cases had been treated with cancer paste, and the recurrences involved the cartilages which seem to lack in repairing ability. One of these was kept under control for two years but not cured, and the patient died from another cause. Another of the failures was a patient who had a plastic operation after removal of a growth on the nose. There was an occasional recurrence, generally along the scar, and he has been treated at intervals for the last five years. The last complaint was within the nostril. Another of these cases was a patient 96 years old, where the cancer had destroyed the end of the nose. Notwithstanding the extensive destruction, this patient was cured and remained well for more than two years when death occurred from old age.

Of the 95 cases involving the cheek, 81 were cured, the most discouraging failures occurring in this region. From the fact of these lesions being easily accessible, it would seem that the percentage of cures should be higher. In two of these cases, carcinomatous nodules developed in the crater of the ulcer which did not break down under a dosage that caused a severe reaction in the surrounding normal skin.

The cases in this region which failed to respond to roentgen treatment were not benefited by other methods either, so far as could be ascertained. Most of them died within a year. The cases in which the failures occurred had excavated ulcers with evoluted edges, and they were treated without filters.

Of the 25 cases involving the external ear, 20 were cured. In the five unsuccessful cases in which the cartilage was involved the lack of ability to repair again seemed to be the predominating feature.

Of the 145 cases involving the eyelids, 134 were cured, the failures occurring in advanced cases where the deeper structures had become involved. Some of them were treated with filters, and others without.

There were 57 cases involving the lower lip, 52 of which were cured. The cases may be divided into periods so far as treatment is concerned. Ten years ago I referred all cases for operation that gave the clinical impression of squamous cell epithelioma without glandular involvement, the operation to consist in a wide V-shaped excision, preferably followed immediately by

post-operative roentgen treatment of the neck. Later experience has confirmed my faith in this method, Bloodgood and others having shown that the V-shaped excision alone is not a safe procedure. Unless the glands are already involved, excision and post-operative roentgen treatment will accomplish as favorable results as a radical operation. This opinion is borne out by the results obtained by experienced surgeons.

As time went on, surgeons insisted upon the radical operation, but as there was objection on the part of patients, I decided to apply roentgen treatment to the lesion as well as the glands in selected cases. The results have been as favorable as in the earlier cases which had either undergone excision, followed by roentgen treatment, or the radical operation alone.

During 1913 and 1914, my method of treating the less dangerous type of lesions of the lower lip as purely local affections gave satisfactory results. Of 15 cases treated in 1914, 13 were cured. The history of one of the unsuccessful cases is of interest.

The patient was a fifty-two-year-old man who presented himself in November, 1914. There was a small oval spot about three-eighths of an inch in length in the middle of the lower lip in the cutaneous side of the mucosal junction. There was a slightly discolored area, level with the surrounding parts. The treatment consisted in application of 20 milliampere minutes with a Bauer-8 tube, without the use of a filter. The distance of the tube was eight inches and the total dose 12 x. Two weeks later there was a marked reaction. On December 21 the crust was removed, leaving an apparently normal healed area. Three months later there appeared an enlarged gland, the size of a pigeon's egg, in the anterior cervical chain. The lip was normal, presenting no evidence of the original lesion. The gland was removed, and post-operative treatment begun six days later, lasting for six months. Early in 1916, the patient returned, complaining of a peculiar sensation in the mediastinum. There being no visible recurrence, he was instructed to report again in two weeks for examination if the trouble persisted. In the meantime, however, he suddenly died, and an autopsy could not be obtained.

The appearance of a gland on the neck some months after an apparent cure of what seemed to be one of the least dangerous cases, has caused me to classify all lip cases as dangerous and to treat the glands in all of them.

As to the cases of lupus, erythematous lupus and keloid appearing in this series, three women with erythematous lupus were not benefited by the treatment. Seven cases of lupus gave discouraging results, only three cases being cured, while the remaining four were unimproved. In the case of a 30-year-old man, carcinoma of the nose developed and the patient died in a horrible condition. One female patient, aged 25, failed to respond to either filtered or unfiltered rays.

There were 11 cases of keloid, eight in males and three in females, all of which were so much improved as to justify their being classed as cured. Because of the effect of the roentgen treatment upon the development of the teeth, one of these cases is of sufficient interest to warrant fuller details.

The patient was a boy three years of age who had been badly burned about the chin and neck six months previously. When first seen, there was a large keloid covering the chin and extending like a band upward into each cheek at the sides of the mouth. This growth seemed to be extending and interfering with the musculature of the mouth which could only be opened slightly and with difficulty. Treatment was continued for a period of three months and later, after an interval of three months, for another two months. Unfiltered rays were applied throughout, causing only a moderate reaction. The end result was good. This child is now eight years old and as yet none of his permanent teeth have erupted. It would have been interesting

to follow up the fate of the delayed dentition, but unfortunately the patient escaped further observation in spite of repeated endeavors to trace him. There is a possibility that there is merely a temporary arrest of development and that the teeth will erupt later.

The end results in this series compare more than favorably with the results obtained by other methods covering a similar period of time. Future results should be more favorable still owing to increased knowledge and improved technic.

Another point of importance is that, in future, fewer cases will probably reach the advanced stage in which most of the failures have occurred.

Caustics and cancer pastes, while curing many cases, will, as a rule, be successful only in the type of cases which are easily cured by roentgen therapy, while the cosmetic result is much inferior. Recurrences setting in after the use of caustics, are likely to be carcinomatous in character and much harder to deal with than those following the application of the roentgen ray, aside from the important fact that roentgen recurrences are much fewer in number and usually respond to further roentgen treatment.

Taking the series of eye cases included in this report as a whole, it may be confidently asserted that they could not have been as satisfactorily dealt with by any other method of treatment. In such cases, roentgen therapy is without a peer. On the other hand, fairness compels me to add that, if a case is encountered which does not yield in a reasonable time to roentgen treatment, nothing is to be gained, according to my experience, by continuing this method indefinitely and that it is wiser to institute some other method in the hope of effecting relief.

THE ROENTGEN RAY TREATMENT OF TUBERCULOUS PERITONITIS*

BY PAUL EISEN, M.D.

North Chicago Hospital

CHICAGO, ILL.

DURING the past two years I have had the opportunity of treating eleven cases of tuberculous peritonitis with deep therapy at the North Chicago Hospital. I desire today to bring before you the results of our observations.

Of these eleven cases six were operated upon at the North Chicago Hospital and one in Rome, all of them before the treatment was instituted, thus verifying the diagnosis beyond any doubt; the other four were diagnosed from clinical symptoms, including roentgenographic findings.

It is a well-known fact that tuberculous peritonitis is a secondary affection resulting from a tuberculosis of some organ within the abdominal cavity; in women most often the tubes and mesenteric glands, while in men the appendix is more commonly the source of infection.

It is the common experience of surgeons that when the abdomen is opened spontaneous cure takes place in many cases. This spontaneous cure in most cases is only apparent, because in the majority of these cases recurrence takes place after a period of time during which the patient appears cured. It has been shown, however, that whenever the primary source—the tubes or the appendix—is removed at the time of the exploration, recurrence occurs in only a few cases.

The roentgenological treatment of tuberculous peritonitis has been employed almost since the therapeutic possibilities of the roentgen rays were discovered, but the

* Read at the Seventeenth Annual Meeting of the American Roentgen Ray Society, Chicago, Sept. 27-30, 1916.

results in the early period could not have been very encouraging, since the treatment for a long time fell into desuetude[1]; but since the technic of deep therapy has been put on a more scientific basis, the treatment was again taken up and we are now able to accomplish a great deal more than we anticipated.

In the seven cases which were operated before treatment was instituted, the intestines were usually studded with tubercles; in some instances tumors as large as walnuts were present in the mesentery. This is the class which usually terminates fatally. Four of these cases have been entirely cured and one, which is still under treatment, is progressing favorably. I intend to show one or two of the series here. The sixth case had tuberculosis of the jejunum and ileum and received during six weeks' daily treatment five and a half E. D., without showing any improvement. The patient discontinued the treatment and is now confined in another hospital. In the seventh case there was very extensive tuberculosis involving the ileocecal region. After exploration, the case seemed inoperable, and Dr. Beck decided to try deep therapy, believing that the patient was not in a condition to have a resection of the bowel. The treatment was carried on for two weeks, the dose being one and a half E. D., with such gratifying results that a resection of the bowel could be carried out. Three feet of the ileum, the cecum, and twelve inches of the ascending colon were resected and an anastomosis performed, but the patient did not rally from this operation, and died. The remaining four cases which were not operated upon and in which the diagnosis was based on clinical symptoms alone, two are improving under treatment, and one receiving 11 E. D. has been well after six months' treatment. The fourth patient discontinued treatment after two weeks.

These four cases of tuberculous peritonitis, although treated with deep therapy with satisfactory results, have not been included in this series because no laparotomy was performed to verify the diagnosis. Two cases operated upon by Dr. Carl Beck were presented by him at the Winter Meeting of the Western Surgical Association, held at the North Chicago Hospital.

Every one of the seven remaining cases which form the subject of this paper have undergone a laparotomy. In one case the peritoneal cavity was not opened for fear of injuring adhesions. The seat of the trouble was principally about the ileocecum, but other parts were also involved, notably the splenic flexure. In one case, the appendix was considered the source of the tubercular infection and therefore removed by Dr. E. G. Beck. In all seven cases the lungs appeared clinically and roentgenoscopically to be uninvolved. It may be stated, incidentally, that in the one unimproved case the absence of lung involvement had led elsewhere to the erroneous conclusion that visible ulcers in the rectum were not tuberculous in nature and the case was demonstrated as such to students in a clinic. No roentgen treatment had been previously applied in any of these cases.

In three cases the diagnosis had been unsuspected. In two others it had been made from the roentgen ray findings alone. In two cases the accompanying ascites gave the clinician the correct clue before the roentgen examination was started. In the absence of ascites the clinical diagnosis is difficult. Muscular rigidity was a prominent feature in all cases, whereas fever was present only in the one protracted case that failed to get well, the fever never ranging higher than 100°. Three cases were treated shortly before operation, and all but one case were treated directly following operation. This one case, an Italian of middle age, was operated as a boy in Rome and applied for treatment here many years later.

In all but two cases there was a steady increase in weight week by week. The weight of the Italian patient increased by three pounds, that of two young women by fifty-five and forty-eight pounds, re-

[1] Dr. J. M. Dodson, Discussion, *Jour. A. M. A.*, 1903, vol. XL, page 73.

spectively, that of two men by twelve pounds and ten pounds. Two patients did not gain in weight and one is now gaining under treatment. The length of time over which the treatment was given was curtailed in some patients for social or economic reasons, but in one of them the treatment was carried out from July 8 to March 23 of the following year, extending in all over eight months; the average duration was from eight to twelve weeks. The areas treated varied in size. The strongly built men were treated through areas three inches square, while in one weak little girl of nineteen, weighing only sixty-eight pounds, an area one inch square was rayed only three times a week with one E. D. every two weeks, through a two mm. aluminum filter. The amount of rays given was different in every case. Whereas the last mentioned girl received but an average of half an E. D. a week, two strong young boys are receiving one E. D. every four days through one mm. aluminum, at a skin-focus distance of six inches, the abdominal area being a two-inch circle in one case and a three-inch square in the other. No two cases can be treated alike, and even the same case is often given more rays as improvement progresses, the amount of E. D. being in some from eleven to fourteen and in others from five and a half to seven. These doses were given in fractional amounts partly over a long time, this being considered the only way leading to success, while in other stronger patients a much greater amount was employed. I judge the dose to be employed by the gain in weight, a steady gain of one pound a week being desired, while often more is attained. The accumulation or disappearance of free fluid where such is present must be taken into consideration. In the one unsuccessful case I also added ultraviolet rays to the rest of the body to help raise its immunity, but without success. However, it might help in other cases and may be worth while trying.

No bismuth or silver salts were given internally to create secondary radioactivity, reliance being placed alone upon the incident rays. Their character, however, was of sufficient hardness, the water-cooled tube never backing up less than ten and mostly more than eleven inches to insure a sufficient percentage of hard rays to reach the peritoneum. The food was the usual hospital food and later after dismissal home cooking. No dieting was attempted, only unripe fruit and raw vegetables being excluded from the régime.

The appetite was generally good, although it often improved during the treatment. The latter lasted only five minutes a day. The patients were asked to seek the sunshine and sleep in rooms with windows wide open. Under careful hygiene patients with tuberculous peritonitis often get on well for a time, but soon there is a relapse; on the other hand, our patients not only became well in a relatively short time, but are well today, some after two and one and a half years' observation.

That the treatment of tuberculous peritonitis is of the most varied nature illustrates the futility of former methods of treatment. Koch's (old) tuberculin is used more for diagnosis than for treatment in these cases. In Rollier's Sanatorium in Lysin some cases have been healed and in Italy the vaccine treatment of Maragliano has many followers, but the majority of physicians in this country, when asked for an efficacious treatment of tuberculous peritonitis, confessed to hopeless nihilism.

In view of the gratifying results above reported, I would recommend that roentgen ray treatment be continued for a long time in all cases of tuberculous peritonitis which have been verified by operation, because the improvement is not at once apparent in the early part of the treatment. The areas to be treated must be determined by the operative findings, and although these areas should be given special attention, other parts of the abdomen may also be included in the treatment.

May this success be a ray of light to brighten the existence of these hitherto hopeless individuals.

THE TREATMENT OF NEVI*

BY W. S. NEWCOMET, M.D.

PHILADELPHIA, PA.

AS the various forms of "birth-marks" calling for treatment are usually located upon the exposed portions of the body, particularly the face, treatment is expected to result not only in their eradication but also in cosmetic perfection. The great difficulty is that any method used to destroy these dilated blood vessels will to some extent destroy other cells of the surrounding tissue which, being particularly sensitive, are much more liable to undergo a retrograde change than the more resistant blood-vessels.

The wide latitude in the dilatation and character of these vessels also enters into consideration. Moles, particularly of the hairy variety, are included in this class; and while not strictly "birth-marks" the structure of their tissue is somewhat similar. Their removal is usually accomplished by similar procedures and the same difficulties are encountered in both varieties. In moles, the vessels are surrounded by an overgrowth of other tissue that enters into the composition of the mass, and those that contain an excess of fibrous tissue will be found exceedingly resistant to any destructive process.

The pathology of these vessels is not generally understood, but there is not the least doubt that the trophic nerves play a very active rôle in these structures. In the more expansive varieties, involving a whole limb or the major part of it, the overgrowth of the underlying structures may extend to the bone. It is the destruction of the nerves, coincident with that of the vessels, that leads to the disastrous results so frequently observed. Such a case, caused by the roentgen ray, has been reported before this Society and several others have come under observation. Through the courtesy of Dr. Wm. Clark of Philadelphia, another equally disastrous result with considerable disfigurement, caused by the application of radium to a "port-wine stain", has been brought to our attention. In that instance there has been extensive destruction of the tissues of the face coupled with the formation of a large keloid which, however, Dr. Clark has been able to relieve to some extent.

While radium has been regarded as a panacea for these angiomata, the unfortunate result referred to above was brought about by one of our most celebrated foreign radiologists and, judging from other cases that have come under observation from several sources, the perfect results following the radiation treatment of nevi have been somewhat exaggerated.

This statement is not made in the spirit of censure. It is based on the fact that operators using any of the numerous methods for the removal of nevi, are usually satisfied with the destruction of the color without considering the fact that the color of the surrounding skin is changed under the influence of excitement, temperature changes, light, etc., while the scar tissue of the former site of the nevus is not. Under certain circumstances there may even be a rather displeasing effect due to the difference in the vasomotor control of the vessels of the affected area and that of the surrounding normal structures.

All birth-marks should be treated as soon after birth as may be practicable. In the first place, there is not the least doubt that they will enlarge rapidly in the first weeks of life, and it is a common occurrence even for the attending physician to comment upon the increase in size of a mark, the very presence of which had escaped him at the time the child was born. These facts have been verified by personal experience in a number of cases, two of which are of more than ordinary interest as the

*Read at the Seventeenth Annual Meeting of the American Roentgen Ray Society, Sept. 27-30, 1916.

infants died, not directly as a result of the nevi, but from intestinal complications. The nevi in both cases were upon the face and neck, extending downward over the chest; they gradually enlarged to such an alarming degree that rupture seemed imminent. At the same time there was considerable embarrassment to respiration. In neither case did the child's condition permit of any operative procedure upon the nevi, and this raises the interesting question: Did the nevi cause the fatal issue, or was it the poor condition of these infants that caused the nevi to enlarge? It might also be mentioned here that a rapid enlargement of nevi will occasionally happen after the application of various caustics for their removal. A second reason for the early treatment is the smaller size of the nevi in infancy, and the fact that the scar will become largely obliterated in the rapidly growing child, while the tissue change is slower in individuals of maturer age. We are often advised not to interfere with these marks, the idea being that malignancy is apt to result from any procedure to remove them. No doubt this opinion is due to the fact that malignancy is apt to become engrafted upon these areas, especially when an unsuccessful attempt at their removal has produced an excessive amount of scar tissue. There is no doubt that some of these nevi, particularly the moles, do tend to become malignant. This happened, for instance, in the case of a young woman who, several years ago, applied for treatment of a mole upon the left cheek, about the size of a ten-cent piece. CO_2 snow was applied, and in a few weeks the area healed. The result seemed to be perfect to all intents and purposes. Within a few months, however, the mole had recurred, covering a larger area and was several times thicker than before. Excision was recommended; and the wisdom of it was confirmed by the pathologic examination, which proved the growth to be a melanotic sarcoma. About a year later the patient was perfectly well.

Many poor results can usually be attributed to lack of experience. One such instance came to my notice several years ago, a surgeon attempting to remove a very extensive "port-wine stain" upon the face with CO_2 snow. Having had no experience in this line, it is needless to remark upon the result.

While there are cases upon which none of the known methods will produce an ideal result, the majority of the blemishes can be removed, leaving but very little evidence of the former trouble.

Where a portion or perhaps the whole area has been treated, it has often been noted as a curious fact that, while the discoloration will not entirely disappear at first, it may after the lapse of a few months result in a perfectly normal condition. In others, some discoloration and swelling due to the trauma of the method of treatment will be observed, and it often requires the treatment of months before the parts assume a normal appearance. This is especially so after radiation.

SELECTION OF METHODS

Surgical.—The accepted surgical procedures constitute a well defined, safe and rapid method for the elimination of angiomata, but they are limited to a certain class of well defined, tumor-like masses which easily lend themselves to ligation. The diffuse varieties have been excised, the operation being followed by skin grafting. As a rule, however, such methods are not to be commended in view of the considerable scarring that is likely to follow.

Caustics.—For small, more or less circumscribed areas, a number of different caustics have been recommended, but as they are apt to leave a permanent whitish scar, the result is objectionable in skins of high color. The substances most commonly in use are: nitric acid, chromic acid, trichloracetic acid, pastes of arsenic, pyrogallic acid, salicylic acid, stick caustic, zinc chlorid, and many others. Freezing with ethyl chloride, the application of CO_2 snow or liquid air is, as a rule, less painful

and can be controlled to a degree quite unattainable with chemical caustics. Besides, the results are better and the remaining scar is not so liable to display that bleached, white color which often makes the scars of chemicals unsightly. In a selected number of cases where CO_2 snow was used, the results were very good, the skin having assumed the character of the surrounding parts at the end of a year. The same method failed in two other cases that came under observation, but it is interesting to note that in both these cases radium was subsequently used with success.

Electrical Methods.—Galvanism is the oldest method still in use; under certain conditions the results may be good. The various forms of high frequency, desiccation, fulguration and diathermy which are now being employed depend more or less upon the same principle of producing an electrochemic change in the tissue which, in turn, produces a certain amount of tissue regeneration. The ultimate scar will closely resemble the normal tissues.

In all these methods the personal equation of the operator must be considered, and where a high degree of skill is employed the results are often remarkably good. They are more or less painful and require the use of an anesthetic where a large area is to be treated.

A number of selected cases have been treated with the electric needle and diathermy. Their only advantage over the other methods is that the control has a wider scope. The results have been uniformly good.

Before. After.

Case 1.—M.T. Angioma of the Tongue (Dr. J. Chalmers Da Costa).

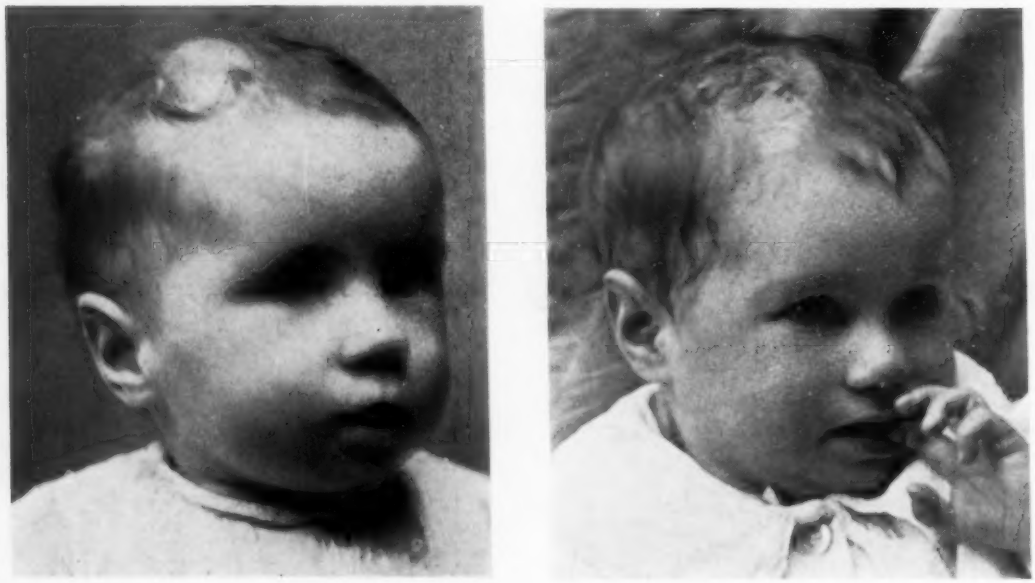
Tumor was gradually increasing in size, causing difficulty in eating and speaking. Treated with 11 m.g. radium.

Ultra-Violet Light.—Cases have been observed where this method has been employed by Dr. Wm. Clark, of Philadelphia, with marked success in the milder and more widely disseminated forms. It certainly has many points to recommend it, and the results are good. The heavier areas are subsequently treated by other methods.

Radiation.—More than ten or twelve years ago the roentgen rays were mentioned by several authors for the relief of angiomatous conditions, but at that time it was not generally adopted, due no doubt to the

Before. After.

CASE 2.—J.M.S. PIGMENTED MOLE (Dr. C. B. Longenecker).
Treated with 4 m.g. radium.



Before. After.

CASE 3.—H.P. CAVERNOUS NEVUS.
Treated with 40 m.g., filtered with 1 mm. lead.

lack of control and the variable susceptibility of the individual to the roentgen ray. The danger of producing a burn was too great in proportion to the result obtained, and ultimately little was heard upon the subject after the lapse of a few years. Not until the use of radium gave a new impetus to the subject of radiation was this method broached again, and at the present moment radium is, generally speaking, usu-

Before. After.

CASE 4.—H.LaF. CAVERNOUS NEVUS.

The superficial discoloration marks only part of the tumor. Compare the shadow of the nose and eyes. Treated with 20 m.g. radium, filtered $^1/_{10}$ mm. lead.

Before. After.

CASE 5.—M.B. CAVERNOUS NEVUS.

Deep, no superficial discoloration. Treated with 40 m.g. radium, filtered 1 mm. lead.

ally employed. Its results have been in some instances brilliant, but it is a popular misconception of the properties of radium to suppose that its mere application will cause the angiomata to disappear, as the results will depend directly upon the control and experience of the operator. Let it be remembered that radium has caused results as bad as the roentgen ray and that the telangiectases and keloids that follow are equally disfiguring.

The reaction from radium closely re-

sembles that following a roentgen radiation with a spark gap of about eight inches and a four millimeter aluminum filter. It is alarming when it occurs but it subsides earlier than the roentgen burn from a low unfiltered tube which, as a rule, begins as a mild erythema and gradually grows from bad to worse. No doubt some one in the future will work out a roentgen technic that will be perfectly safe.

The difficulty in treating these marks with any form of radiation lies in the unevenness of their structure. It can easily be understood that the heavy areas so often surrounded by lighter areas require a different dosage; and if the whole area is treated *en masse*, the result will not be uniform. The technic adopted must, as a rule, be purely individual, depending first upon the case and secondly upon the supply of radium and how it is preserved. The ideal method would be to employ the emanation, as the size, shape and dosage could be considered for each individual case. Unfortunately, under present conditions, every operator is limited to a small supply of the element, and ideal methods cannot be employed until some large organization shall control the supply.

SELECTION OF THE CASES

So far as true nevi are concerned, the best results are to be expected in the cavernous type where the veins are covered with healthy skin. Among the available methods, the electric needle, galvanism, or diathermy will destroy the enlarged veins without injuring the underlying skin. If, however, the skin is involved and the superficial layer discolored, the application of radium will give the best results. (Cases 4 and 5.) The form of nevi that presents the greatest difficulties both in treatment and cosmetic results is the very superficial and widely disseminated variety and for which radium, high frequency, and the ultra-violet light have been employed. The pigmented nevus, unless too deep, will yield most satisfactory results under radiation, either from the roentgen rays or radium. (Case 2.) If the area is very extensive, the roentgen ray is attended with some danger from over-treatment of the underlying parts. Where the nevus is thick and leathery, the cosmetic result is questionable. The fact that these nevi are covered with hair does not seem to have any effect upon the result, as several rather extensive areas were treated with perfect success. This is rather a contrast to the thick, leathery variety.

It may be stated in a general way that radiation offers the best means for the eradication of the more severe types of nevi. (Cases 1 and 3.) The smaller ones may be treated by many other methods with perfect results, but where radiation is selected caution must be observed, especially in cases where other means have been previously employed. The scar tissue produced by caustics and similar methods depending upon cauterization is extremely sensitive to radiation. At times, ulceration is difficult to avoid, and the results under such circumstances are extremely poor.

In conclusion it may be stated that:

(1) There is no ideal method for the treatment of "birth-marks."

(2) While certain methods are better adapted to certain classes of these "marks," the results obtained depend largely upon the experience of the operator and his control of them.

(3) Any form of radiation employed in the treatment of these "marks" is attended with some risk.

(4) Whatever method is selected or employed, the first application should not be exaggerated. It is easy to repeat the process, but hard to remove the scars.

(5) Consideration must always be given to the trophic influence, which differs in proportion to the size and depth of these vessels, and is difficult to control.

(6) The earlier in infancy some form of treatment is adopted, the better will be the result, as involution will often continue when once a retrograde process is started, until the whole "mark" disappears.

PRESENT STATUS OF ROENTGENOTHERAPY IN LEUKEMIA*

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NOTWITHSTANDING the progress of the past few years in roentgenotherapy, and especially as applied to deep-seated malignancy and non-malignant gynecological conditions, the average results obtained in the treatment of the leukemias have improved but little.

We are still obliged to regard leukemia as ultimately an incurable disease and to be satisfied with a prognosis which implies a prolongation of life from a few months to six or eight years, during a period of comparative comfort, partly taken up, however, by intervals of treatment for threatened or active relapses. The evidences of care and experience are to be found in the extent of prolongation of life, the comfort and strength of the patient and ability to attend to business or work, and the freedom of the period of observation from frank relapses. Successful results require care in the preliminary treatment of the active period of the disease, persistence in treatment until every manifestation has disappeared, a careful watch over the patient thereafter, and a resumption of applications on the appearance of the first evidences of a relapse. The first indications of a relapse are changes in the differential count or a slight rise in the leucocyte count, or both.

In a paper read before this Society in 1907[1] we recommended that the roentgen applications be directed mainly and primarily against what we believed to be the primary focus of the disease—the bone marrow—rather than the secondary manifestations, the enlarged spleen and lymph glands, as had been previously the custom, leaving the exposure of these structures until a later and safer period. It is unnecessary to again defend this policy or to re-enter into a discussion of the relative merits of the two methods of treatment at this time. We have seen no good reason to alter our views in regard to the pathology of the disease, and we have continued to follow along the general lines of the technic first advocated, notwithstanding numerous experimental changes from time to time. Various modifications have been instituted, attendant upon the institution of the many radical changes and improvements in deep therapy during the past few years.

With the advent of the Coolidge tube we experimented extensively with intensive dosage at close range, following the technic now generally employed in deep therapy. Cross-firing through the bones was practiced to a certain extent. Finding that the treatment of small areas by intensive dosage required really more time in the end and was in the long run not so efficacious, we have returned in a measure to our older method of exposing larger definite areas of bone from a distance, reducing the maximum dosage over any area somewhat below 20 x, but using the same penetration and filtration ordinarily employed in deep therapy.

The treatment of the spleen has been considerably modified by the modern technic. The excellent results reported by Henri Béclère at the International Medical Congress, London, in 1913, first induced us to make a radical departure from the older method of exposing large areas of splenic tissue. The technic then reported had been employed for three years and comprised the exposure of the spleen alone. The entire splenic area was divided into zones of 8 to 10 cm. diameter, and cross-

[1] PANCOAST: "Experimental and Practical Application of the *X*-Rays in Diseases of the Blood and Blood-Forming Organs, with Review of Literature." *Univ. Penna. Med. Bul.*, January, 1907.

STENGEL AND PANCOAST: "A New and More Rational Method of Treatment of Leukemia by the *X*-Ray. Preliminary Report." *Jour. A. M. A.*, April 25, 1908.

PANCOAST: "Further Contributions on the *X*-Ray Treatment of Leukemia." *Amer. Quar. of Roentgenology*, April, 1911.

STENGEL AND PANCOAST: "The Treatment of Leukemia and Pseudoleukemia with *X*-Rays." *Jour. A. M. A.*, September 28, 1912.

*Read at the Seventeenth Annual Meeting of the American Roentgen Ray Society, Chicago, Sept. 27-30, 1916.

firing was practiced from the front, side and back. Rays of 8 to 9 Benoist penetration filtered through 1 mm. of aluminum in doses of 4H or 8x units were directed to each area at intervals of three weeks. This method was at once adopted by us in our splenic exposures, after the modifications to make it conform with modern deep therapy technic. We have used rather smaller ports of entry and have kept the dosage over each slightly within 20 x. After the patient has received one or possibly two series of bone applications, the spleen is exposed in the manner just described, only one area being treated per diem at first, until we are certain the patient can stand more. It is far safer to deliver an intensive dose through a small portion of spleen than to give a comparatively small dose over a large area of the entire spleen, as was the practice many years ago.

The institution of modern methods of deep therapy in leukemia, modified to suit the peculiar condition with which we are dealing, has shortened the time for inducing a primary symptomatic cure of our cases, and the average prolongation of life has, perhaps, been slightly increased, but the ultimate results have not been altered. There still remains the lack of conformity of ultimate result with the remarkable and often brilliant effects of the primary period of treatment.

We still advocate the use of small doses of arsenic in those cases in which progression ceases and the condition remains stationary without further improvement, and also those in which there is a low red count or the red corpuscles or hemoglobin are diminishing.

In recent years, benzol has become a strong competitor of the roentgen ray as a therapeutic agent in leukemia, but when results have been carefully compared we believe that the latter is to be preferred and is safer. Both agents have been carelessly or improperly used, and just comparisons are difficult, but we have been satisfied to continue with roentgen therapy alone, as have those clinicians who have referred cases to us for the past twelve years. We are opposed to the routine use of both agents at the same time, and for much the same reasons as for the employment of large doses of arsenic in conjunction with the roentgen ray.

Our experience with benzol covers its use in four cases. In the first case, seen in consultation with Dr. Crane, its addition to roentgen therapy, which at the time seemed to have lost its efficacy, certainly saved the patient from impending death, and prolonged life several months. In two other cases, the substitution of benzol for roentgen therapy was decidedly unsuccessful. The fourth instance occurred within the past two weeks. The patient, referred by Dr. Perry Pepper, responded well to his first treatment and a complete symptomatic cure was obtained. He remained perfectly well and was able to attend to his work, without treatment of any kind for over two years. Although told to have a blood examination made at monthly intervals, he failed to do so after a few months and came back with a decided relapse. He responded well to the second series and the desired result was almost attained when he developed an acute relapse during the last hot spell, with rapidly rising leucocytosis and falling hemoglobin and red cell count, and we were obliged to stop treatment. Small doses of benzol were administered by Dr. Pepper, but he failed to respond.

The pathology of this disease is still in dispute, and it is quite likely that little more progress will be made by roentgen therapy until the pathological problem becomes definitely settled, and there is disclosed a new and certain therapeutic agent or the way is paved for a more exact roentgen technic. In the meantime, the results of the past few years show that roentgen therapy is the most successful and the safest agent known in the treatment of leukemia.

The discussion of this subject has lain dormant for many years, and it is to be hoped that its resumption may be of benefit to all of us.

COMMENTS ON ROENTGENOTHERAPY*

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IN the language of the day, roentgenotherapy has arrived. It is no longer necessary to plead with the family physician or consultant to refer the case for roentgen treatment. The patient himself now frequently seeks the *x*-ray, irrespective of medical counsel, and it is quite refreshing to note how intelligent co-operation from an awakened public is gradually replacing old time ignorance and prejudice.

FIGS. 1 AND 2.—EPITHELIOMA OF THE NOSE

One aspect of this situation is of some concern to roentgenologists, and that is the mad desire of many general practitioners to do *x*-ray work of all sorts, not realizing their unpreparedness both in training and experience for this class of work. This is due to the fact that manufacturers are flooding the country with *x*-ray apparatus of every conceivable kind, and with literature explaining how singularly easy it is to become an expert roentgenologist in about forty minutes if you will only buy their apparatus, etc. In my own city, there are no less than five hundred portable *x*-ray outfits scattered among the followers of the different schools of healing, for which a heterogeneous body of law-makers in California is responsible. It is safe to assume that the same evil flourishes elsewhere in the United States, but perhaps not so vigorously as here. Work performed under instrumentation of this kind, and by operators either ignorant or deliberately grafting, can only have a detrimental effect on organized scientific roentgenotherapy, and bring discredit upon many who, properly equipped, are doing earnest work along this line. It can not be gainsaid, however, that with comparatively small and simple apparatus, much good has already been accomplished, when the efforts have been guided by intelligent and qualified men, and these re-

* Read at Seventeenth Annual Meeting of the American Roentgen Ray Society, Chicago, Ill., Sept. 27-30, 1916.

marks are not intended in any way to cast reflections upon such.

What I particularly desire to lay stress upon is the treatment of superficial malignancies and, referring to dosage, I offer no apology for stating that I do not believe the modern massive dose has any

FIGS. 3 AND 4.—LUPUS NOSE

FIGS. 5 AND 6.—ACTINOMYCOTIC ULCER

place in the treatment of such lesions. I know this is contrary to the views and teachings of some of our eminent workers, but I am convinced in my own mind that the massive dose should never be employed unfiltered, and a filtered ray for a skin lesion is very much like using a steam hammer with which to drive tacks. It overshoots the mark, and is both uncalled for and detrimental to the work in hand. Neither do I believe in using an infinitesimal or useless fractional dosage, but there is a happy medium between these extremes which can be properly adjusted to meet the exigencies of any particular case, and which will yield results that compare favorably with those of any other technic that I have so far seen employed. These results will not necessarily follow the use of a machine-made dose table, but depend largely upon the personal factor in estimating for each case the desired amount or, in plain words,

the operator's ability to successfully treat the patient rather than the disease.

Treating deep-seated conditions under a sound skin through multiple small ports of entry, as first suggested by our European confrères, seems cumbersome and unnecessary. I can conceive of no situation where adequate *x*-ray energy can not be applied through comparatively large ports, provided sufficient filtration and protection are provided.

The toxic symptoms and prostration, which frequently follow massive dosage, are now happily controlled by fresh air and the exhibition of alkalies as already promulgated by members of our own society. It is interesting to note, in passing, the marked similarity between this undue *x*-ray reaction and the effect of tropical solar heat upon some of our people in the south. It is not unreasonable to assume that the remote action of both agents is identical, and as some skins seem to resist the sun's rays better than others, may it

FIGS. 7 AND 8.—RODENT ULCER—RIGHT ELBOW

FIGS. 9 AND 10.—RINGWORM OF RIGHT BREAST

not be possible to infer that this same protection extends to a number of *x*-ray patients who are free from such disagreeable after effects? In this connection are we to accept the statement that idiosyncrasy to the *x*-ray no longer exists, that with our present knowledge of improved technic this has practically disappeared? By no means. Idiosyncrasy to the *x*-ray, while not frequent, is a factor which has to be reckoned with in every case when beginning treatment, and it is found in individuals in the same proportion as are the idiosyncrasies produced by certain fruits, shellfish and drugs.

FIGS. 11 AND 12.—RECURRENT CANCER—LEFT BREAST

All honor to that splendid American, Dr. Coolidge, whose epoch-making contribution to roentgenology has opened wide the portals of advanced therapy. Let us not forget, however, that the Coolidge tube is an exceedingly powerful agent, and unless it is surrounded by every safeguard at our command, it may easily lead to irreparable damage, the ultimate extent of which can only be measured by the lapse of time. Anent the massive dose, a great many operators associate this exclusively with the Coolidge tube, yet I am quite sure that a massive dose can be delivered with any good standard tube.

In conversing with a number of colleagues recently, it was evident that there exists much confusion as to what constitutes a massive dose, and I am free to confess that it is not clear in my own mind. I accept as a massive dose any single exposure which is equivalent to a full pastille or erythema reaction. A long time prior to the Coolidge tube we had no difficulty in obtaining an alarming erythema with our common gas tubes, and often with a very short exposure. In fact, many years ago one of our well-known Western surgeons had the skin, fascia, and even muscles of his abdomen destroyed by what was thought to be a therapeutic dose; surely this was a very large massive dose, misapplied. God speed the day—and it is not beyond the pale of possibilities—when we will be able to select a bundle of rays, project them to the desired depth, there to stimulate, inhibit or destroy at will. Then shall roentgenotherapy have reached the pinnacle of perfection.

Accompanying this article are a few slides of patients treated by the intermediate dose method, neither infinitesimal nor massive, but sufficient to do the necessary work and in a reasonably short time. They are picked out of my case records extending over a period of sixteen years.

DISCUSSION OF PAPERS OF DRS. DACHTLER, EISEN, NEWCOMET, PANCOAST AND SOILAND

DR. WILLIAM ALLEN PUSEY, Chicago.—In general my findings agree with those reported this morning. Everybody has been conservative; everybody has been staying within the facts, and understating his results rather than exaggerating them. It is too bad that some of the surgeons who think that they are the only conservative people in treating cancer could not be here this morning to see the attitude of other men. As regards epithelioma, the reports made to-day correspond closely with mine. I have gone through the whole period of *x*-ray enthusiasm and *x*-ray depression, but I am glad to say that my views to-day based upon fifteen or sixteen years' experience are the same that I have held since I have had enough experience to develop views upon the use of *x*-rays in epithelioma. Fortunately early in my experience I formulated certain indications for the use of *x*-rays in epitheliomas that have stood me in good stead ever since. My rule has been that if radical treatment required only the destruction of the local epithelioma, *x*-rays is a safe method of treatment. If, however, radical treatment requires removal of adjacent glands, or of deep-seated underlying tissues, *x*-rays should not be used in preference to operation if operation is feasible. All of my experience has shown me that epitheliomatous tissue on the surface can be destroyed as definitely with *x*-rays as by any other destructive measure, and I am more confirmed than ever in the belief that for uncomplicated epitheliomas *x*-rays is the best method of treatment.

As to the treatment of lesions about various parts of the face, the eyelids, for instance, my experience also corresponds with what has been said to-day. For the treatment of lesions on the ciliary border, the roentgen ray is a most valuable agent. You can cure these lesions and save the eyelid, which cannot be done if a piece of the cartilage is removed. In lesions of the inner canthus, particularly if there is involvement of the intra-orbital fat, my experience has not been so good. I have seen many such cases that have gone by the board in spite of all we could do with the roentgen ray.

There is another lesion about which we are constantly at war with the surgeon, and that is epithelioma of the lower lip. There is a school of surgeons which maintains that every epithelioma of the lower lip should have a radical excision, including thorough cleaning out of the neck. That sounds easy, but it is not a feasible procedure in the case of very old patients, or in many young patients, for that matter. If I had a superficial epithelioma of my lower lip, no surgeon could excise it and remove all the glands. The fact remains that many good surgeons do not do it, do not want to do it, and even have members of their own families treated by the roentgen ray. My rule for the treatment of epithelioma of the lower lip is to touch no case where operation is practicable, unless it is of a character where you may expect that there is no involvement of glands under the jaw. It takes a good deal of experience to determine cases of that sort, but anyone who has had considerable experience can select his cases. About seven years ago I reviewed my cases treated in that way, and of approximately sixty cases that I traced for three years or more, there were only two or three failures, about six per cent., which corresponds about with the figures of fatal results from radical operation, according to the statistics of some of the large hospitals. Of course, in a case of epithelioma where the nodules go deep into the substance of the lip you are likely to fail with *x*-rays, and surgeons should have first trial of such cases. The chance of a

cure is extremely remote by any method of treatment if the glands of the neck are involved. I do not say that such cases should not have operation; they should, but the fact that you fail with the roentgen ray does not mean that the surgeon will not fail too. He usually does.

As to nevus, I get about the same results as reported this morning. At present, I do not believe that the roentgen ray is the best treatment for most vascular nevi. I treat pigmented nevi usually with the roentgen rays to the point of producing a reaction and getting rid of the hair. I get as much benefit as I can in that way. Then I usually try to smooth the surface by the careful use of carbon dioxide snow. In these cases you must be very cautious. The *x*-rays have produced hypersensitiveness of tissues and endarteritis in the small vessels, and then when you use carbon dioxide snow you must use very weak applications—one or two or three seconds, which is the equivalent of ten, fifteen, or twenty seconds on the normal skin.

For vascular nevi, I have ceased to use the roentgen ray. In some flat vascular nevi I have gotten perfect results—made them disappear with practically nothing remaining. In large angiomatous nevi, I often get a very great shrinking and a very great improvement, but, on the other hand, at times, I do not succeed so happily. In the flat nevi you are apt to get a remainder of telangiectasia or roentgen ray keratosis which interferes with the result.

As to the use of radium in nevi, you get the same results from it as from the roentgen ray. The objection to radium is that in using the applicator you must treat small areas, and you are apt to checkerboard the skin.

For flat vascular nevi, the best method of treatment at present is, I believe, the ultraviolet light from the quartz lamp. In these lesions you can get beautiful results in that way and without unpleasant after effects.

In the cavernous angiomas, I use radium, roentgen rays and carbon dioxide snow, depending on the case and the results I am trying to produce.

I was interested in what was said about the use of the roentgen rays in tuberculous peritonitis. I, too, have had a considerable experience with these deep-seated lesions of the abdomen and pelvis, and my results have been quite in accord with those reported here to-day. I have had some cases of tuberculous peritonitis which showed the improvement mentioned by others. One patient, the daughter of a very distinguished surgeon, got well twelve years ago and has remained well. She was treated by roentgen rays and surgery, and you can ascribe the results to operation if you please.

In regard to leukemia, my experience agrees with Dr. Pancoast's. I see no reason why we should be surprised that the roentgen rays do not cure leukemia and pseudoleukemia. All the rays do is to cause the absorption of the lymphoid tissue in these cases; it does not cure. It does much good, and I have seen a good many cases cured symptomatically and the improvement maintained for months or a year or more.

I believe that at the present time the roentgen ray offers more prospect of amelioration than anything else. Dr. Pancoast and Dr. Edsall called attention a few years ago to the toxic effects arising from the rapid destruction of large masses of tissue by the roentgen rays in leukemia. At that time I said I had not seen such effects, nor have I seen any since then, although they may occur. I give exposures in these cases that, to use Dr. Pancoast's expression, amount to nothing or almost nothing, and that may be the reason why I have not seen such toxic effects.

DR. GEORGE C. JOHNSTON, Pittsburgh. —Regarding the treatment of tuberculous peritonitis, if the abdomen has been opened and the air has circulated freely among the intestines, and we expose the patient afterward to the roentgen ray, we have no right to claim anything for it. Everything that

can occur by the application of the roentgen ray to the abdomen, I have seen occur without such application.

I have a patient whose abdomen was opened for tuberculous peritonitis. He never had any roentgen treatment and he has made a complete recovery without recurrence after nine years. I have had several other such cases in which I saw the abdomen opened, the peritoneum studded with tubercles, fluid in the abdomen—no roentgen ray used, and yet these patients are well. We can claim results only when the abdomen was not opened. Twenty years ago I first saw the abdomen opened for tuberculous peritonitis and that man is perfectly well to-day.

Dr. Kennon Dunham, Cincinnati.—What Dr. Johnston said is true. I meant to call attention to some work that is being done by Dr. Savage of Cincinnati on the treatment of tuberculosis in cattle by the administration of ether, alone, without opening the abdomen. His work will be published later. Murphy, of the Rockefeller Institute, has shown almost conclusively that great good can come by raising the lymphocyte count. I am sure that this will have practical application. The roentgenologist should know what effect the roentgen ray has on the lymphocyte not only as to its relative count but also its proportional.

Dr. George E. Pfahler, Philadelphia.—Referring to the case of keloid following a burn reported by Dachtler, and in which he gave superficial fractional doses of unfiltered rays, and following which treatment there was no erythema of the skin or keloid, I cannot agree that the non-eruption of the teeth was due to *x*-ray treatment. It would as likely be due to the preceding burn from fire. I have treated a number of cases of malignant disease of the jaw in children, and their teeth have erupted normally. I have not seen any atrophy following such treatment. In three of the cases treated by me, the tooth which erupted directly from the diseased area was found twisted upon its axis, but otherwise there was no interference with the eruption of the teeth.

Regarding tuberculous peritonitis, I have in mind a boy who had been operated upon, and improved following the operation, but did not get well. He had extensive thickening of the tissues in the abdomen with sinuses, and was pale, puny and sickly. I gave him roentgen treatment over the entire abdomen, and he is now a strong, healthy boy. The improvement followed immediately after the *x*-ray treatment, and I believe can be ascribed directly to the treatment. I believe that it will be found, when properly used, that the roentgen ray is useful in tuberculosis in different parts of the body, but this subject needs careful investigation and scientific study. We must not be hasty.

Regarding the lymphocyte count: within the past year I became interested in the work reported by Dr. Murphy and with Dr. Clarence Smith made a series of investigations in a considerable number of cases under treatment. We did not find any more variation in these cases than in the average patient not treated by the *x*-rays. Our experience, therefore, in using the lymphocyte as control of treatment has been discouraged.

With regard to epithelioma of the lip, at present I am destroying the epithelioma first by the high frequency current, and then by the deep roentgenotherapy over the lip and the glandular areas leading from it. I am getting better results than from the roentgen ray alone, or from surgery.

In the treatment of nevi, I have had most satisfactory results by destroying the lesion by the high frequency current, and using the roentgen ray afterwards to prevent the formation of keloid. In the case of flat nevi I have seen the best results from the use of the quartz lamp, as suggested by Dr. Clark, although I have not used it myself.

In leukemia, I have followed the technic suggested by Dr. Pancoast, and my

results compare with his. I get brilliant early results, and three or four years later the patient has a sudden relapse which ends in sudden death.

MR. H. W. DACHTLER, Toledo.—Dr. Pusey has covered the ground so well that there is nothing to add on that side of the subject. Dr. Pfahler's point is well taken. I reported the case because it came to my attention about a month ago and I wondered whether it was due to the burn or to my treatment. There was a mild reaction and the treatment was continued over a long period of time—over five months. The child was treated two or three times a week without filters and without marked reaction. Perhaps I can make observations later. Although the keloid had not disappeared entirely, I refused to continue the treatment. If the teeth do not erupt or are delayed in eruption, it is a point to be considered.

DR. PAUL EISEN, Chicago.—Concerning the statement by Dr. Johnston, I want to call special attention to one case in which the incision was made but the abdomen was not opened because it was impossible to do so. Four patients were not operated on at the hospital and are being treated. There is always a question as to the diagnoses in these cases. One of the four I believe is a tuberculous ulcerative colitis, especially of the splenic flexure. We have found bacilli in the stools but it is a question whether it is really a tuberculous peritonitis. The patient had been operated on previously. The appendix and gall-bladder were removed, together with an ulcer of the duodenum and stomach. From that fact alone and the incision being in the middle it led us to believe that it was a case of extensive tuberculosis.[1] Without opening the abdomen you can never prove, however, that it is a case of tuberculous peritonitis. I want to lay stress on those cases only in which the diagnosis is absolutely certain. I know that these cases get well.

[1] Patient has since then been reopened for pyloric obstruction and no tuberculosis of the bowel evident anywhere.

Dr. Emil Beck treated two cases of tuberculous sinus with bismuth paste and they got well without any other treatment. In one case the patient gained twenty-five pounds in eight weeks, and he is working and earning his livelihood. Without treatment I have never seen a patient get well so soon.

Regarding the lymphocyte count, it is still, I think, under dispute whether this can be used to raise the immunity of the body. An increase in the number of lymphocytes does not necessarily mean an increase in immunity. At present the best way to judge of the rise in immunity is by the increase in body weight.

DR. W. S. NEWCOMET, Philadelphia.—Doctor Pancoast has mentioned cases of leukemia relieved by the roentgen rays where benzol had failed. Two more cases can be placed upon record. In the first the patient was bedridden with her stomach upset whether from benzol or natural causes of the disease, we do not know. However, the patient is still alive after the third year and is in fairly good health. The second case was not in such an extreme condition but, as in the first instance, improvement followed roentgen treatment. The quartz lamp has been used in a number of cases by Dr. Clark, but the heavier portions of the nevus are destroyed by some other means such as desiccation.

In regard to radium therapy, it is at present where the roentgen ray was fifteen years ago and our results will not be any better than they are until we understand better how to use radium. The flat applicator is worthless so far as the investment. The tubes are perhaps a little better, although the method of using them is not good, no matter whether we have 200 mg. or 5 mg. When a better method is developed where the active product is used, the tube will become obsolete. The great obstacles are the cost of such a plant, and the trouble of manipulation. I am not at all satisfied with my technic, but I do the best I can under existing circumstances.

DR. H. K. PANCOAST, Philadelphia.—I was very glad to hear the discussion on tuberculous peritonitis, having treated a number of cases years ago and reported the results some time in 1905. There are two classes of cases; those with a large amount of fluid and tubercles all over the peritoneum, and those in which the peritoneum is covered with a thick plastic exudate. The first type invariably recovers after operation. The other type does not, and it is in that class of cases that the roentgen ray should be used, with or without operation.

Dr. Pusey spoke about the small dosage in leukemia. In former years a large number of cases were referred to us that had been treated elsewhere, and by carrying out the treatment as outlined by us, we were able to get results where others had failed. It is pertinent to again sound warning against the treatment of acute lymphatic leukemia, because a great deal of harm has and still is being done, that is, the ultimate results are hastened. I recall a case treated recently in another city. The doctor wrote us, asking whether we would advise roentgen ray treatment in the case, one of acute lymphatic leukemia. Unfortunately, we replied by letter instead of by wire, and before the letter reached the doctor, the patient had received one treatment and promptly died.

THE MEDICAL OFFICERS' RESERVE CORPS*

UNITED STATES ARMY

BY the terms of the army bill passed June 3, 1916, the Medical Reserve Corps, as now authorized by law, will cease to exist after June 3, 1917. According to a circular just issued by the assistant surgeon-general, officers of the present Medical Reserve Corps may be transferred to the Officers' Reserve Corps at any time prior to June 3, 1917. There is a slight change in name, but without change in relation to the surgeon-general's office. The new corps, however, will be on a more practical basis than is the present one. Under the present arrangement the officers of the Medical Reserve Corps are such in name only; under the new order, the members of the Officers' Reserve Corps assume responsibilities which will guarantee their efficiency and dependability in time of need. The commissions are issued for a period of only five years; at the end of that time officers may be recommissioned with reëxaminations. Attendance at camps of instruction is required for a period of fifteen days in each year, the government paying the transportation and subsistence to and from camp, and subsistence while in camp. Officers are, further, required to complete a correspondence course conducted by the field service and correspondence school for medical officers. This has been optional in the past. In time of peace no officer above the grade of first lieutenant can be ordered into active duty, but first lieutenants may be so ordered. In time of war or stress, the service of all reserve officers is at the disposal of the government as against the provision of the old law in which reserve corps officers could be called to active duty only with their own consent. The holding of two commissions, that is, a commission in the Officers' Reserve Corps and in the National Guard, will not be permitted. The law, without doubt, is a decided improvement, and gives to the United States Army a more reliable and more serviceable medical corps. Every officer in the new medical reserve corps may be counted on for actual service in time of need, and through the correspondence course and the required annual camp instruction will be a more efficient unit.

* From *Jour. Am. Med. Assn.*

KNIFE BLADE IN BRAIN*

ROENTGEN AND CLINICAL FINDINGS

BY E. BLAINE, M.D.

Roentgenologist to the Cook County Hospital

CHICAGO, ILL.

DURING the routine of roentgen examinations at Cook County Hospital, a patient was received from the observation ward with a request to determine whether he suffered from a "fracture of the base of the skull." The unusual facts discovered in this examination warrant a report of the case partly on account of the interest it entails from a roentgenological standpoint and partly from the lack of clinical symptoms, when the nature of the injury is considered.

The patient was an ice delivery man, 43 years of age, weighed 205 pounds, and was of Slav nationality. He had fallen off an ice wagon, striking his head on the granite pavement, seven days before entering the hospital. During the week he had been confined to bed with a severe headache and marked dizziness. The latter had disappeared and the headache lessened materially, when patient entered the hospital. Nor was there any other subjective complaint. A diagnosis was made of "concussion of brain due to a fall, with probably a basal skull fracture." The preliminary examination was incomplete and the patient was immediately referred to the roentgen department. The report was as follows:

"There are no shadow indications of a basal skull fracture as such. However, a basal skull fracture could be inferred from the presence of a very unusual shadow discovered in the anterior fossa which is undoubtedly the blade of a knife (probably similar to a 'jack' or 'pocket' variety). This shadow is seen on the stereo plates to extend from the outer table of the right frontal bone 2 to 3 centimeters above and 1 cm. internal to the external angular proc-

1. PHOTOGRAPH OF PATIENT WITH KNIFE BLADE IN THE SKULL. (View with ordinary hand stereoscope.)

* Read before the Chicago Roentgen Society, Oct. 6, 1916.

ess of the orbit, downward and inward through the external and inferior portion of the frontal lobe of the brain, through the floor (base) of the anterior fossa, penetrating (fracturing?) the roof of the right orbit on its inner side, the point of the blade resting in the middle and posterior ethmoid cell region. This knife blade is 8 centimeters from the broken end in the wall of the cranium to the tip point in the ethmoid region. It is approximately 1.5 cm. wide and the back of the blade is directed upward and somewhat inward; the cutting edge of the knife is directed downward. The relation of the foreign body (its point, the cutting edge, the broken blade, etc.) to the skull as a whole would lead to the conclusion that it had been driven in when held in the hand, with the forearm raised and flexed, the blade of the knife on the ulnar side of the hand and the handle held as in driving a pointed object into the wall or similar object, or as would be held in an attack, at close quarters, on the patient with intent to do bodily harm."

On being questioned, the patient gave a vague account of having had a fall from a tree at the age of twelve, striking his head against some metal lying on the ground. He denies having been seriously injured and speaks of it as a scratch which hardly bled at all. When closely pressed for specific answers the patient became nervous and suspicious and would give unsatisfactory and contradictory answers. Perspiration became quite free and he seemed anxious to get away. When confronted with the roentgenological evidence, he referred to the tree accident as an explanation.

On account of his imperfect command of the English language, the history could only be obtained with difficulty. He states that he has never had any convulsions or previous headaches. Has never vomited, except when intoxicated. No history of any previous illness. Denies venereal infection. Parents died of old age, six sisters are living and well. Patient is single, well nourished and apparently perfectly well. Physical examination of the head was negative except for very slight faded scars at the left eye, one above and the other below the outer canthus. There is a slight asymmetry of the face, the left side being slightly smaller than the right. The muscles of the right half of the face show more action than those of the left. The left nare and nasal ala are slightly less in size than the right, and the left corner of the mouth is drawn slightly back. There is a very slight suggestion of ptosis of the left eyelid, while

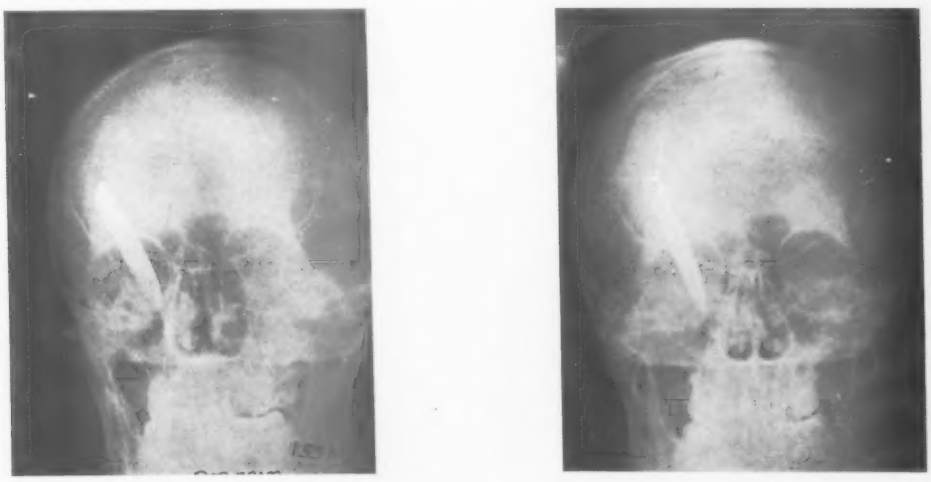

FIG. 2. POSTERO-ANTERIOR STEREOROENTGENOGRAM, SHOWING KNIFE BLADE IN SKULL. (View with ordinary hand stereoscope.)

the right is raised to a higher point and the right eyebrow is arched higher than the left. There is a weakness of the left external rectus; no nystagmus or squint. Vision and smell normal. No deviation of tongue or uvula. Facial sensation normal except for a small area about the lower scar.

Touch pressure epicritic: pain and temperature tested and found complete to waist line. Two point touch is poor, 2 to 5 cm. before any notice of second point. Teeth are in bad condition—"PPPPP" is poorly said. Patient slurs and forgets easily—Reflex areas are normal.

Neck, thorax and abdomen, negative. The left leg is slightly smaller in circumference than the right. Patient hops poorly on left foot. Slight ataxia, more on left foot. Slight spasticity of left leg. Slight incoördination of movements of hands and feet more marked in the left arm and left leg.

A lumbar puncture was made; slight increase of pressure noted, albumin positive. Both the blood and the cerebro-spinal fluid were examined for Wassermann reaction and found negative.

The patient left the hospital a few days later in normal condition, his headache and dizziness having entirely disappeared.

The story of his fall out of a tree onto some metal scrap does not account for the presence of the foreign body discovered in the roentgenograms. This is practically impossible from a mechanico-physical standpoint. It is clear that the knife blade after having been driven into the skull was sharply bent over sideways in order to break off the outside portion (as is often done in certain districts of Europe) in order to destroy evidence. This recalls the glass stiletto murders in which the blade is plunged straight into the body, usually in the back in the kidney region, and the hilt snapped off and thrown into the river or other convenient place to hide it.

The difference of the body development, showing a left sided retardation, would suggest that the patient was not full-grown at the time of this occurrence. The foreign body has undoubtedly been present for at least twenty years. The symptoms, whatever they may have been, after receiving the injury, have entirely disappeared. The portion of brain tissue involved does not include any of the motor areas, and consequently there is but slight motor disturbance.

It is evident that the patient wished to hide the real cause of this injury and the deduction of a quarrel with perhaps fatal result to the patient's opponent is probably not far wrong. A full history of this case would surely show a different tale from that given by the patient.

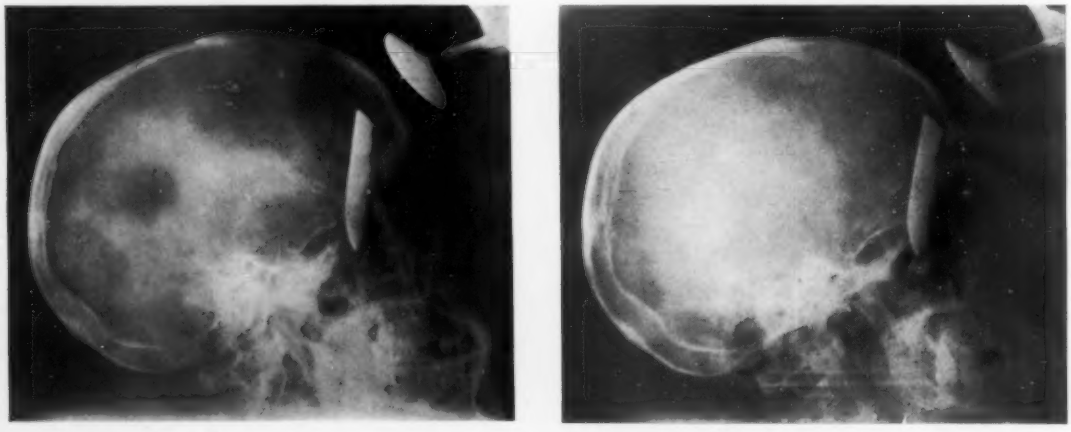

FIG. 3. LATERAL STEREOROENTGENOGRAM OF SKULL, SHOWING KNIFE BLADE. (View with ordinary hand stereoscope.)

A BED SUPPORT

BY DAVID R. BOWEN, M.D.

PHILADELPHIA, PA.

IN hospital practice it is often highly desirable to make roentgen examinations of patients in their beds.

This becomes especially difficult if the bed is fitted with woven wire springs both because of motion and because the sagging makes adjustment of the plate difficult.

We have found a "jack" very convenient for this purpose. An inexpensive automobile jack was fitted with a substantial wood base and a board top fifteen inches square. This gives a firm even support under the middle of the bed and can be adjusted without disturbing the patient in the least.

A NEW ELECTRIC PROBE

WE may not believe with some that electricity will in time solve all our mechanical problems, but the present war is demonstrating its effectiveness in many ways; for example, the repulse of armed forces by electricity with charged wire fences, rapid communication by portable telephones, lighting of the trenches, electrotherapy for paralyzed limbs, etc. Now this powerful agent bids fair to be useful in another way, that is, in the troublesome problem of discovering the whereabouts of a bullet hidden in the tissues. Many telephone probes and magnetic deflectors have been devised, but the chief objection to all of them is the grave one of impracticability.

A new probe which makes use of electricity is worked according to the following plan: A galvanometer is used to which are attached a fine metal probe and a contact wire. The latter is placed in the edge of the wound in contact with the tissues, while the probe is employed in the usual manner. There being no difference in potential between the wire and the probe the galvanometer is undisturbed until the probe comes in contact with a bullet, when a voltaic cell is formed, the foreign body being one pole, the contact wire the other, while the blood serves as the electrolyte. A marked deflection of the galvanometer then occurs.

The apparatus is comparatively cheap, costing about fifty dollars, is portable, and has been found quite trustworthy in the several military hospitals where it has been tested. If these reports of its value are well founded, it will no doubt replace the telephone probe to which most surgeons object on the ground that they cannot distinguish the sound of the probe striking a foreign body from other sounds heard constantly in the receiver.—*New York Med. Jour.*

AN AUSTRO-HUNGARIAN ROENTGEN WAR AUTOMOBILE

A NEW TYPE

DR. Emerich von Gerzo, assistant surgeon to the Royal Hungarian University at Budapest, communicates to the *Fortschritte auf dem Gebiete der Roentgenstrahlen* for October 14, 1914, the following details of a war automobile with a roentgen equipment which he has devised, the expense having been defrayed by the late Baron Babarczi-Schwarzer.

FIG. 1. AUSTRO-HUNGARIAN ROENTGEN WAR AUTOMOBILE.

Von Gerzo starts with the statement that according to the experience derived from the Red Cross Expedition in the Balkan War, the medical service in war times is woefully deficient without a roentgen outfit and accordingly he set to work to meet the problem. He used an Opel chassis of 14–30 h.p., capable of running at the rate of 24 to 30 kilometres an hour with a load of 2000 kilos (total four tons or less). (Fig. 1.) The body of the car is 3 m. long, 1.45 wide and 1.70 high, and is divided into two compartments. The front compartment is about 1.2 m. in length, serves as a dark room and has its own door on the left side. The other compartment contains the roentgen apparatus with all instruments and reserve parts. The dynamo is worked from the benzine motor and built in under the chauffeur's seat. A lever makes the connection.

All manipulations are carried out in the dark room which contains a work table at the anterior wall, with a basin for rinsing purposes on the right. A water reservoir with a capacity of 60 liters is on the roof. When the basin is covered with a board, there is a surface of 55 x 140 cm. available for dishes. A folding seat is fixed at the back wall. A shelf over the table and a box under the photographer's seat are used for storing chemicals. Lead-lined boxes in the right corner contain the photographic plates. The roentgen tubes are above these boxes, suspended by a spring in a wooden frame which guards them from breakage in transportation. A tarpaulin cover protects them from dust and, incidentally, the operator from flying glass in the event of explosions. Windows at opposite sides can be screened or covered with a red pane. There is a ventilator which does not admit light, and a writing desk.

The roentgen room (Fig. 2) constitutes the back compartment. It contains an "Ideal" roentgen apparatus, model No. 2 (Reiniger, Gebbert and Schall), consisting of a motor, transformer and commutator. The apparatus is fixed at the anterior wall with hinges. There are a portable regulator table, a tube stand, an operating table, a specially constructed device for working the tube under the table, fluorescent and intensifying screens, a few reserve tubes properly suspended in springs and protected, and all necessary accessories. Everything is placed in the order it is used.

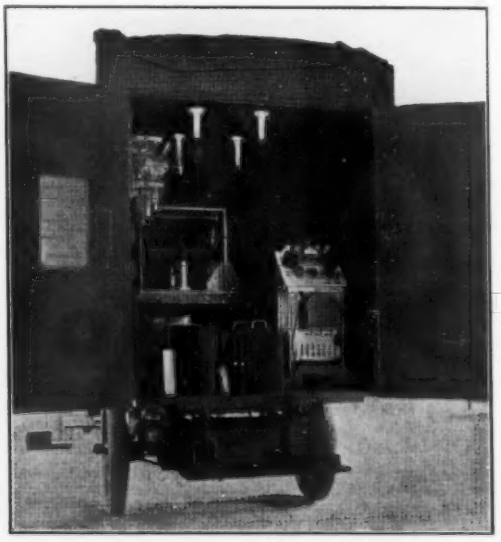

FIG. 2. VIEW OF WAR AUTOMOBILE SHOWING THE ROENTGEN ROOM.

When using the car in the field, the roentgen apparatus remains inside, and from 3 to 5 minutes are required to make the preparations for an exposure. A collapsible tent is taken from the roof and combined with the roentgen room. Plates are used, wrapped in black paper. If the apparatus is used inside a house, a cable about 50 m. in length makes the connection. If a central station of 110 volt direct current is available, the apparatus is fed by the latter. There are two windows in this compartment, the latter being large enough to accommodate a wounded man, if necessary. Provision has been made for repairs. Since every part of the outfit can be easily removed, it may be placed at the disposal of hospitals in war or peace times, the empty auto being used for ambulance or other purposes.

X-RAY PROTECTION*

WHEN the discussion on *x*-ray protection was resumed at the Roentgen Society's meeting on March 7th, 1916, Dr. W. Hartwood Nutt said that he was inclined to believe that the tired feeling of which *x*-ray workers complained was due not to ionization but to ozone, which, according to some qualitative tests, was liberated by *x*-rays. Dr. G. B. Batten laid stress upon the danger of associating work with chemical substances, especially alkaline materials, with *x*-ray manipulation. He had noticed a dermatitis supervene in a case of ringworm which previously had been treated with picric acid. Major Wilson, Canadian Medical Corps, said that the ideas of British manufacturers with regard to protection were certainly below the standard deemed necessary with the heavy transformer outfits obtained from the United States and Canada. In the Canadian military hospitals the most complete rubber protection was insisted upon, and a layer of 8 lb. lead (if possible a double layer) was passed around the tube box. The President (Mr. J. H. Gardiner) announced that the authorities of the National Physical Laboratory had stated that they were prepared to examine any protective material submitted to them, and to give a certificate upon its absorption coefficient.

* From *British Medical Journal*.

It may interest our readers to know that the United States Army has subscribed for twenty-two copies of THE JOURNAL OF ROENTGENOLOGY for 1917.

WALTER JAMES DODD

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EDITORIALS

WALTER JAMES DODD

WALTER JAMES DODD was born in London, England, in the year 1869, and came to this country as an immigrant boy at the age of fifteen. He was early moved by a desire to follow the sea, but was induced by the college authorities, impressed by his ability, to continue life here as an assistant in the chemical laboratory of Harvard College, in Cambridge. He acquired a profound knowledge of chemistry, and, in 1892, was appointed to the Massachusetts General Hospital as assistant apothecary and four years later as apothecary. It was in this capacity that he undertook experimentation with *x*-rays under the usual restricted and unfortunate conditions which obtained in the early days. A severe dermatitis was therefore sustained in 1896, and he underwent his first operation therefor in 1898. Since that time he had been the subject of *fifty operations* for roentgen dermatitis or its sequelæ.

Seeking to dignify his position in a work already dignified by his undertakings at such sacrifice, Dodd studied at the Harvard Medical School in 1900 and 1901, but completed his course and was graduated from the University of Vermont in 1908. Since that year he had held the position of Roentgenologist to the Massachusetts General Hospital, an official recognition of what had been, in reality, his position for many years.

With the organization of a department of roentgenology in Harvard University, he was appointed Instructor, a position which he held at the time of his death. He was an honored member of the St. Botolph Club of Boston, as well as of many medical societies, in addition to his membership in the American Roentgen Ray Society.

Such, briefly, were the events in a life of singular beauty—the life of a gentle man, loving and beloved, cheerful beyond conception in the presence of physical anguish. Glorified by a martyr's soul, his face was turned toward the horizon of High Purpose with an obliteration of self that cheapened and made tawdry the usual motives of men—ambition, calculated accomplishment and petty gain. He journeyed steadily toward that horizon, turn-

ing into the gold of loyal friendship all those who came within the Midas-touch of his personality.

A life such as his gives Charity a new meaning. As a crown to its later years, his ear was alert to hear, from the far land of his adoption, the call of the nation of his birth, in dire need of the peculiar service which he could give. Disdaining physical handicaps and added risks, he hastened forth to labor for England with a heroism that even she knew not of.

Thus again have fallen the Burden and the Staff, and again has another been received into the glorious band of those whom Self-sacrifice, upon the altar of a noble cause, has immortalized.

PERCY BROWN.

IN MEMORIAM

The death of Dr. Walter J. Dodd of Boston has added one more name to the Honor Roll which all roentgenologists over the entire world honor and revere.

Alas! Many of the early workers know from personal experience what he suffered as a result of his noble self-dedication to his profession! And the patience and fortitude with which he bore this suffering compelled all who knew him to love him; and anything that might be said of him, especially by one who has not suffered as he did, must sound very inadequate, perhaps even presumptuous. But the branch of medicine in which Dr. Dodd was truly one of the earliest pioneers has developed so rapidly that many of the younger men were not fortunate enough to know him personally nor from association with him to have received the inspiration of that something that words cannot describe. The "spirit of sacrifice" perhaps defines it better than any other phrase. Some one has aptly said: "There is no true progress without the sacrifice of human life." He who truly sacrifices himself for any cause is bound to be loved and reverenced by many. But rarely does the sacrifice avail so much as in his case. All roentgenologists who have escaped the inconvenience and suffering which he endured are directly or indirectly indebted to him and to the others on this Roll of Honor for their immunity. When the dangers of roentgenology were first recognized many forsook this work and took up less hazardous tasks; but not so with Dr. Dodd. With genuine heroism he remained at his post, and at such tremendous sacrifice skillfully applied what he had learned to the relief of thousands and thousands of patients, to whom he gratuitously gave his expert services. And not content with what he had done for medical science, nor with the sacrifice he had made for his fellow-roentgenologists, and eager to carry relief even beyond the wide circle of patients in his own city, he responded to the call to go to the battle front, and although perhaps far enough behind the firing line to escape the danger of the shells, he well knew that he was exposing himself, without adequate protection, to a peril that for him was even greater than shell fire in the trenches. Yet his interest in the relief of the suffering of others led him to forget his own danger and once more his spirit of self-sacrifice was unhesitating. His "good manner of life" sets a high goal that it will be hard to attain unto, but the mere effort to try for this goal will develop the character of roentgenologists and raise the standards of roentgenology.

In his death the American Roentgen Ray Society loses one of its most honored and ardent members, conspicuous alike for his ability and for his modesty, for his high attainments and for his faithfulness to duty; and in his life the Society will always see an exemplification of the ideal for which it stands.

LEWIS GREGORY COLE
President

SOCIETY PROCEEDINGS

On Saturday evening, December 16, the New York and Philadelphia Roentgen Ray Societies were the guests of the New Eng-

land Society at a dinner given at the Copley Plaza, Boston, Massachusetts. Forty-five men were present. The address of welcome was made by Dr. Percy Brown, and responses by Dr. Leopold Jaches for the New York Society and Dr. W. F. Manges for the Philadelphia Society. Dr. Lewis Gregory Cole of New York, President of the American Roentgen Ray Society, the guest of honor, made a short address. Dr. G. C. Johnston of Pittsburgh gave the principal talk of the evening on "Little Journeys in Roentgenology."

Farewell Dinner to Mr. and Mrs. Clyde H. Snook

On December fifteenth the Philadelphia Roentgen Society honored Mr. and Mrs. Clyde H. Snook with a farewell dinner. Owing to the requirements of his business, Mr. Snook finds it necessary to remove to Chicago. He is a charter member of the Philadelphia Roentgen Society and was its first secretary. The honor accorded Mr. and Mrs. Snook was deeply appreciated by them. We are pleased to assure Mr. Snook that the Philadelphia Roentgen Society voices the sentiments of the entire American Roentgen Ray Society in doing honor to a member who has contributed so much toward the active developement of the science of roentgenology.

The midwinter meeting of roentgenologists, Western section, will be held on February 22, 1916, at Hotel Gibson, Cincinnati, Ohio. Dr. Kennon Dunham, of Cincinnati, is in charge of the program arrangements.

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TRANSLATIONS & ABSTRACTS

WALTHER, H. W. E. Ureteral Calculi. Their Diagnosis and Treatment. (*Interstate Med. Jour.*, August, 1916, Vol. XXIII, No. 8, p. 675.)

This is an excellent summary of our present knowledge of ureteral calculi, not only with reference to *x*-ray findings but also to other physical findings. The author adheres to the view that there are a certain number of ureteral calculi which will fail to cast shadows, no matter with what care the *x*-ray work is performed. He thinks the chemical composition of the stone plays no part in the matter, and cites the work of Geraghty and Hinman in support of his statement. The declaration is made that "conservative roentgenologists state that only about 65 per cent. of stones in the ureter can be demonstrated in the roentgenogram. The position and size of the stone play an important part in the determination of results, and it is probable that the vast majority of failures to get stone shadows depend more upon these two factors than any others."

Emphasis is laid upon the danger of relying on a single set of negative plates. Very often a second roentgenogram will demonstrate the calculus.

RENTON, HAROLD F. A Case of Double Cervical Rib. (*Lancet*, London, July 29, 1916, Vol. CXCI, p. 187.)

Although cases of bilateral cervical rib are common, the history of this case seems to warrant special mention. The patient, a man of forty-two, had been under treatment for a considerable period for what he called "dyspepsia." This consisted of pain which passed in girdle fashion along the left ribs from the axilla towards the breast and backwards toward the scapula. The pain had no relation to food, however, and nothing gave him relief.

At the time the patient consulted his physician he thought he had recently injured his neck. He had been lifting a heavy sack of flour and had slipped in some manner, throwing the whole weight of the sack against the side of his neck. Since the accident he had been troubled with persistent pain on the left side of the neck and a dull, aching pain down the left arm. The pain in the arm followed the inner aspect of the limb and passed downwards to the third and fourth fingers and the inner side of the ring finger. There was, moreover, a feeling of numbness on the inner and back aspect of the upper arm. The patient complained that his three inner fingers seemed to be asleep, and that the pain in the arm was worse when the limb was allowed to hang loose, vertically downwards, and when he rested his head on his pillow at night.

Roentgen examination showed the presence of a large left cervical rib and a small cervical rib on the right side.

The particular interest in this case centers in the following points: (1) The absence of symptoms, with the exception of the girdle pain, until the day of the accident. In a young individual symptoms are rare at first, but when the sufferer has reached the age of the patient under discussion, pressure symptoms are commonly present. (2) The possibility that the accident had resulted in partial dislocation of the cervical rib, so inducing an acute onset of the typical symptoms. (3) The great length of the cervical rib as shown in the roentgenogram. (4) The explanation of the distribution of the pain.

KETRON, L. W. and KING, J. H. Gastro-Intestinal (Especially Fluoroscopic) Findings in Acne Vulgaris. (*Jour. Am. Med. Assn.*, Aug. 26, 1916, Vol. LXVII, No. 9, p. 671.)

While the acne bacillus is the direct cause of acne vulgaris, there are a number of recognized predisposing factors, among which may be mentioned gastro-intestinal diseases, although the observations have been solely of a clinical nature.

The authors give a brief survey of literature on the subject, then describe the technic of their examinations, which include test meals and analysis of gastric contents, as well as fluoroscopic examination following the digestion of the barium. Ptosis of the stomach was considered present when the lower level of the stomach was below the level of the crest of the

ilium. Ptosis of the colon was considered to be present when the transverse colon lay below the level of the crest of the ilium.

Thirty cases taken from the skin clinic were examined according to the technic and standards just mentioned. The most common gastric findings were hyperacidity, 48.1 per cent.; retention, 36.6 per cent.; atony, 33.3 per cent., and ptosis, 40.0 per cent. The most common intestinal findings were cecal stasis, 46.6 per cent.; ptosis of the colon, 36.6 per cent., and right lower quadrant adhesions, 23.3 per cent. Clinically, 63.3 per cent. of the cases gave evidence of gastric disturbances, and 40 per cent. of them were constipated. The authors conclude from their results that the well-established clinical observations as to the association of these conditions have, in many cases, a well-founded pathologic basis.

It will be interesting to compare with this series of thirty cases, the findings in thirty presumably normal individuals. The editor doubts very much if the presence of ptosis is any more constant in subjects of acne than in normal individuals.

HOLLAND, C. T. A Note on Renal Calculi With an Account of an Interesting Case. (*Arch. Radiol. and Electrotherapy*, August, 1916, Vol. XXI, p. 83.)

Holland's large experience in connection with the Liverpool Royal and Children's Infirmaries has emphasized the point that kidney and ureter stones so invariably show on *x*-ray plates that any error from this point of view may be ignored. The very rare pure uric acid stone in a kidney or ureter need not be considered, and, with proper technic and care, all other stones should be shown. The only exception to this is that occasionally the shadow of a small stone may be superimposed upon the shadow of the bones of the sacro-iliac region, and thus escape notice.

It can be stated that not once during the past eleven years has a stone been found at operation which did not show on a plate previously exposed. Only once has the author met with a stone of what might be described as of "surgical size" (and this one was afterwards passed per urethram) which, at the time of the *x*-ray examination, was almost certainly in the kidney, and which did not show on good plates. This stone on subsequent examination was found to consist entirely of uric acid and moisture, no other constituent of any kind being present. It is to be noted that this calculus was not too large to be passed.

In a discussion on the rarity of uric acid stones, Holland cites the publication of Thelwall Thomas in the Liverpool Bio-Chemical Journal, 1908, Vol. III, p. 346. Holland insists that the uric acid stone of surgical size exists so rarely in a kidney or ureter that for diagnostic purposes it can almost be ignored.

X-ray errors do not consist in failing to show a shadow but in misinterpreting the shadows shown. As a rule, the kidney stone itself does not give rise to difficulty, although, even with these, difficulties and errors of diagnosis must occur, and the man who does not confess to having made such mistakes had better give up *x*-ray work. Nothing is more annoying than to make these mistakes, but there is perhaps more to be learned from mistakes than from successes, and they should be noted and remembered.

Ureter stones, on the other hand, offer a great and often insuperable difficulty. Many, from their shape and position and other slight characteristics of the shadow, are obvious and the diagnosis may be made with certainty. Many are doubtful. Many are so different from the usual that they suggest other things. The catheter, the cystoscope, the separation of urine, collargol, stereoscopic roentgenograms, and all the other devices still occasionally fail to clinch the diagnosis, and only operation reveals the yes or no of the question.

The author cites a very interesting case of a large dermoid cyst with a long pedicle, so long that it could take up any position in the right abdomen and pelvis. The roentgenogram of this case showed a shadow which seemed characteristic of a stone in the right ureter just above the bladder. It was found at operation that the shadow thought to be a stone in the right ureter was an immature tooth in the dermoid cyst.

GUTTMAN, J. and HELD, I. W. Carcinoma of the Esophagus Perforating into the Right Bronchus. (*Med. Rec.*, June 10, 1916, Vol. LXXXIX, No. 24, p. 1039.)

The authors report a case in which the fistulous communication between the esophagus

and bronchus had existed for some time. The diagnosis was made upon the findings of the esophagoscope and the fluoroscope. The authors tell us that they are able to find only one other case in the literature of an esophagobronchial fistula produced by carcinoma and diagnosed in a living patient, by esophagoscopy and fluoroscopy. If this is true, it is only because the men who have seen these cases have failed to publish them, for the abstracter of this article knows personally of at least six or seven cases where this lesion has been discovered under the conditions named by the authors.

Held emphasizes that from the standpoint of differential diagnosis, the esophagoscopic picture could have been brought about by a compression from the outside, by an enlarged thyroid, by an aneurysm, by a tuberculous lymph gland, or by a mediastinal tumor.

HOLMES, B. and RETINGER, J. The Relation of Cecal Stasis to Dementia Precox. (*Med. Rec.*, May 6, 1916, Vol. LXXXIX, No. 19, p. 815.)

Holmes has devoted a great deal of his time during the past few years to dementia precox with special reference to the relation between this disease and the various nutrition disorders. Anyone interested in this subject will find it profitable to look up and study all of the papers that this investigator has offered.

In this paper the authors review the works of Keith, Cannon and Case in demonstrating the relation of cecal stasis and the factors causing it. In examining the motor efficiency of the intestinal tract in cases of dementia precox, the authors early discovered the spasm of the colic sphincter and the reduplication of the transverse colon between the hepatic flexure and this sphincter. The number of patients they were able to examine have been too few to give this observation any great value and their opportunities have not been adequate to carry on this study.

The clinical history, the physical and biochemical examinations, and the symptoms of dementia precox are consistent with a toxemia going out from the decomposing refuse of intestinal digestion in the cecum, where they have been long retained. The betterment which occurs in many cases of dementia precox during an attack of typhoid fever might be explained by working out this hypothesis.

It seems that any research on dementia precox ought not to neglect the study of the motor efficiency of the colon and its relation to the toxic amines.

CASE, JAMES T.: A Roentgenological Study of the Gastrointestinal Tract in Diabetes. A Report of 72 Cases. (*Jour. Am. Med. Assoc.*, XLVII, No. 12, Sept. 16, 1916, p. 858.)

In summarizing the statistics and general results of 72 cases of diabetes recently examined roentgenologically at the Battle Creek Sanitarium, Case states that in spite of the necessity of careful attention to intestinal hygiene as part of the treatment, the literature contains very few articles dealing with intestinal stasis as a cause of diabetes. He mentions Brosch, A. C. Jordan, N. Mutch, Croftan.

The roentgen studies in the 72 cases were carried out according to the routine established by the author in the Roentgen Department of the Battle Creek Sanitarium, full details of which he communicates, including the necessary preliminaries.

Gallstones were definitely visualized in 6 of the cases (8 per cent.), while in 8 others suspicious shadows proved to be gallstones at operation—another example in support of Case's contention that suspicious shadows should be reported. In view of the close relationship between gallbladder and pancreatic affections, the significance of this high percentage of gallstones in diabetes is obvious.

In a large number of the cases, a transverse stomach was found, probably due to adhesions, notably hepatofixation, and also to the fact that obesity is a frequent condition among diabetics.

In two cases there was carcinoma of the stomach and in two carcinoma of the pancreas.

The emptying time of the stomach was unusually rapid, being from 4 to 7 hours and a half. These findings agree very well with clinical experience, it having been shown that aspiration of test meals in diabetes must be made within twenty or thirty minutes to be effective. Duodenal stasis was observed in only one instance, and Case believes that the difference in the definition of duodenal stasis may account for the difference between his and more frequent findings reported by other authors. The duodenal shadow has failed to

impress him that there is a characteristic change in the dimensions of this bowel in diabetics as compared with normal individuals. The ampulla of Vater was not visualized in a single instance, while twenty-five or more of the cases in which a dilated ampulla was observed, were non-diabetic. This result was rather unexpected on the assumption that duodenal stasis is common in diabetes.

Iliac stasis was present in the severe cases, this being a characteristic sign, and it would probably be more apparent in mild cases, too, if the author's conservative definition of iliac stasis were less strictly applied. Incompetency of the ileocecal valve was shown in thirteen of the twenty worst cases, and in ten of the twenty mildest. It was found competent in the remainder of both categories. The degree of incompetency can not as yet be satisfactorily determined. No constant relation could be established between the severity of the diabetes or the degree of iliac stasis and the presence or absence of adhesions of the terminal ileum, nor the severity of appendical involvement.

Spasticity of the distal colon existed in 46, of the proximal in 14 cases.

The average emptying time of the colon was 48 hours in the twenty worst, and 36 hours in the twenty mildest, cases, the normal time under the circumstances of the tests being about 36 hours.

SIMMONDS, M.: Dangers of Pyelography. (*Muench. med. Wochensch.*, Vol. 63, No. 7, Feb. 15, 1916, p. 229.)

The author has found from cases under his observation that there is no danger from collargol poisoning in using pyelography, but that septic infection is a serious complication. This is of practical importance, as the knowledge of such a possible danger will cause the surgeon to adopt the necessary precautions. He will have to avoid most carefully any lesions of the renal tissue when making the infusion and he will have to find out beforehand whether the urinary bladder contains any infectious germs. If so, pyelography is contraindicated. Furthermore it follows in the interests of clinicians and pathologists that in all cases of sickness or death after pyelography, a bacteriological examination of the blood should be instituted, as only the latter can furnish the requisite information.

CLARK, JOHN G.: Results Obtained by the Use of Radium in the Treatment of Cancer of the Uterus. (*Ann. Surg.*, Nov., 1916, Vol. LXIV, p. 602.)

Clark bases his article upon the results obtained by the use of radium in the treatment of cancer at the University of Pennsylvania Hospital at Philadelphia. He first refers to the limitations of the applicability of the surgical treatment of cancer. Approximately 80 per cent. of the cases of cancer of the uterus received for examination at the University of Pennsylvania Hospital were inoperable, only 20 per cent. of the cases being considered within radical operative limits. This statement was based upon the fact that within the last two years 49 cases of inoperable cancer of the uterus were treated with radium, and during the same period only 12 cases were considered as suitable for radical operation.

The results of the radical operation have proved conclusively that, with very rare exceptions, the hopeless cases are those of the metastatic type. In carcinoma of the fundus the statistics of various surgeons do not differ to any marked degree, because extirpation of the uterus generally suffices to give good results. So long as the growth is confined to the fundus, recurrence does not take place in more than 50 per cent. of cases, provided even simple hysterectomy is performed. We are all fairly well satisfied with the results of operation in cancer of the fundus, whereas no one regards the operative treatment of cancer of the cervix with any great degree of optimism. To attain a higher measure of success, some more efficient means than the scalpel must be employed. This remedy has not as yet been discovered. Notwithstanding the remarkably good results that have followed the use of radium, the author still adheres to the dictum that the uterus and all possible adjacent tissue, if the growth is very limited in its extent, must be extirpated. Beyond this point, however, he has grown quite conservative.

The crux of the situation, therefore, as our experience has taught, is to attempt surgical measures only in the clearly operable cases, leaving the large remainder to secure relief from therapeutic efforts, which give as good or, as we now believe, even far better results from the use of radium.

In the inoperable cases, Clark believes the

Percy method holds out a distinct hope; nevertheless, he does not share the great degree of optimism shown by the inventor of this method as regards the cases of widespread extension. His experience at the University of Pennsylvania Hospital convinces him that radium offers the most helpful outlook of any remedy thus far presented in the palliative and occasionally the curative treatment of the border-line and inoperable cases. Of 69 cases reported treated up to September, 1915, the malignancies involving the uterus, vagina and urethra, practically all of these would, according to our past standards, have been classed as inoperable and, therefore, would inevitably have been doomed. Of these 69 cases, 13 died during the first twelve months following treatment. Ten were not traced. Of the remaining 46, two were alive at twenty-two months; three at eighteen months; seven at twelve months; and seventeen at six months.

Radium, as is shown in our series of cases, is by no means a universal panacea for cancer, even when the growth is strictly localized. There is no way of determining which cases will be benefited by its use. There is beyond doubt a certain percentage—how small or how great we cannot tell from our experience—in which cancerous growths are not retarded by radiotherapy; indeed, occasionally it would appear that there is a positive acceleration of growth.

Clark quotes Schauta's experience. In Schauta's first series he used radium in too large amounts and too often, with most disastrous results. One patient died of pyonephrosis; eight patients showed steady loss of weight, with diarrhea, tenesmus, fever, vomiting, headache, and reduction in blood count. The autopsy findings showed severe necrosis and fistulæ with diphtheritic and purulent inflammations of the rectum and bladder, sigmoiditis, and ulcerative processes in the pelvic coils of the ileum. *One striking point, however, noted at the autopsies was that in not a single instance was a trace of local carcinoma found.* In the method of its application, however, the remedy proved far worse than the disease, but this investigator established beyond question that radium emanations were absolutely destructive to cancer cells. The more moderate dosages employed in his later series of cases gave eight apparent cures out of eleven patients treated, and in no instance were fistulæ or necrosis produced, and the weight and general condition of the patient showed marked improvement.

Schauta's later technic is as follows: From 30 to 50 mg. of radium, filtered through 1.1 mm. of gold, 1 mm. of platinum, and 0.75 mm. of brass, are applied in from 5 to 8 exposures of 12 hours each, at intervals of from one to several days; an interval of rest of three to four weeks is then allowed to elapse, followed by a second but shorter exposure, and in some cases, after another interval of two to three weeks, a third series of applications is employed.

As an evidence of the widespread skepticism concerning these newer remedies, and in spite of this very favorable personal experience, Schauta declares that although he will use radium in advanced cases, he will still continue to employ Schuchart's radical method of performing vaginal hysterectomy in the clearly operable cases, reserving radium as a post-operative prophylactic agent. It would also appear to be a self-evident fact that the post-operative effects of the Percy method must fall far short of those of the radium cases.

Clark concludes with the following important observations: "Removal of the uterus in cases of cancer of the fundus has yielded such good results that I do not feel we are justified in taking any chances with radium, not even in the border-line cases. *Our attitude toward the cervical and fundal growths is diametrically opposite. In border-line cases of cancer of the cervix we invariably employ radium. In advanced cases of cancer of the fundus we invariably perform a hysterectomy.*"

BRICKNER, WALTER M.: The Cause of the Roentgen Shadow in Cases of Subacromial (Subdeltoid) Bursitis. (*Am. Atlas of Stereoroentgenology*, June, 1916, Vol. I, No. 2, p. 34.)

It has been supposed that the shadow often found in the neighborhood of the greater tuberosity and head of the humerus in cases of subacromial (subdeltoid) bursitis was due to thickening of the bursa or to a calcareous deposit in the bursa.

Brickner believes this shadow is not due to thickening of the bursa, but to a lime salt deposit *beneath the bursa*, or in and upon the supraspinatus tendon. The bursa itself casts no shadow, even though at operation it may be found thickened and adherent, and containing some effusion.

The deposit may be very small or quite large, even forming a cap over the outer portion of the head of the humerus. It is most often located near the greater tuberosity. It may appear singly or in multiple.

Brickner believes that the roentgenologist in wording his report should say that the roentgenogram "shows a calcareous deposit (or deposits) beneath the subacromial bursa."

MORSE, W. E.: The Relation of Acid to Gastric Discharge and Duodenal Regurgitation in the Dog. (*Am. Jour. Physiol.*, Oct., 1916, Vol. XLI, p. 439.)

This article is of great interest to roentgenologists as containing an important interpretation of gastric and intestinal findings. From a review of physiological literature one receives the impression that the presence of an acid reaction in the stomach is essential to and hastens gastric discharge. This is not entirely concordant with clinical observations. In cases of so-called hyperacidity a retarded emptying of the stomach with resulting atony and dilatation is often found. Also in cases of achylia gastrica, where there is practically no free acid found in the stomach, the normal rate of discharge is often unimpaired. It therefore seems probable that the presence of an acid reaction is not the only essential factor in the control of gastric discharge.

The conditions imposed in this research were first, a normal fasting animal stomach; second, fluid injections of constant temperature and quantity but of varying acidities; third, abolishment of inhibiting sympathetic reflexes by pithing the spinal cord. The results of the experiments may be summarized as follows:

1. Water is discharged from the fasting stomach of anesthetized pithed dogs more rapidly than any percentage of acid.

2. The rate of discharge is decreased with increase of acidity.

3. Duodenal regurgitation, as evidenced by the increase in the contents of the stomach, often occurred at 0.2 per cent. acidity and in nearly all trials occurred at or before 0.3 per cent. acidity was reached.

4. Increase in acidity increases the frequency and amount of regurgitation from the duodenum.

Throughout these experiments the presence of acid in the stomach in general has been observed to retard rather than to hasten gastric discharge. Spencer, Meyer, Rehfuss and Hawk observed that 1 per cent. sodium bicarbonate leaves the stomach rapidly, while 5 per cent. leaves slowly. In the light of their observations and the results of this series of experiments it appears that the acidity of fluid gastric contents has no function in producing or hastening gastric discharge, but the discharge seems to be controlled by the irritability or non-irritability of gastric contents to the duodenal mucosa.

NEMENOFF, M. I.: Study of the Biologic Action of the Roentgen Rays. (*Russkiy Vrach*, Vol. XV, No. 27, p. 629. Ref.: *Jour. Am. Med. Assn.*, Oct. 7, 1916, p. 1121.)

Among the results of the experiments on dogs related by Nemenoff, is the striking proliferation of the interstitial cells and the cells of the prostate gland when the testicles were exposed to the roentgen rays. He explains this by the fact that the roentgen exposures do not modify the supply of nourishment to the testicle, and as the generative cells, the cells of external secretion, are destroyed under the influence of the rays, the other cells get the benefit of the nourishment which otherwise would have gone to the generative cells. He agrees with Bouin and Ancel that the interstitial cells are the ones responsible for the internal secretion and the secondary sexual characters. Castration, by removing the whole of the testicle, sweeps away both the external and the internal secretion, but exposure to the roentgen rays annuls the germinative function fully as effectually, while not interfering with the internal secretion unless by increasing it, owing to the better nourishment of all the cells outside of the oversusceptible generative cells.

Of course it is impossible to apply directly to man the results of experiments on animals, but these striking phenomena involuntarily suggest a connection with the proliferation of the cells of the prostate in the elderly. This hypertrophy of the prostate occurs exclusively at that period of life when the genital functions are usually dying out. His research shows that Wilms' suggestion to treat it with roentgen exposures is directly contraindicated. He recalls further the temporary retrogression of mammary tumors and the subsidence of uterine myomas after ovariectomy, and the atrophy of the prostate liable to follow castration. On the basis of these and other data cited, he propounds the following question: "If the dys-

trophy induced by roentgen exposures of the testicle can lead to hypertrophy of the elements of internal secretion and this to proliferation of the parenchyma of the prostate, is it not possible that the growth of benign and malignant tumors may also be the result of atypical proliferation of tissues under the influence of dystrophy of certain elements in glands with an internal secretion?"

VAN DE GRAAF, ANNIE MULDER: The Roentgenogram as an Aid in Diagnosis of Subdural Hematoma (De Röntgenphoto als hulpmiddel bij het herkennen van hæmatoma dura matris). (*Nederl. Tijdschr. v. Geneesk.*, 1915, ii, 1837.)

The author has examined the literature but failed to find any cases of subdural hemorrhage shown by roentgenography.

She describes a case in a woman of 36. As a child she had probably had encephalitis but recovered. Since her 19th year she had had mild psychic equivalents of epileptic attacks, but no definite attacks. In recent years had used potassium bromide regularly. In May, 1914, she fell down a stairway. She did not lose consciousness, but injured her hip so that she had to remain in bed three months. Suddenly two weeks after the accident developed hallucinations of sight which disappeared after a few weeks. In March, 1915, brought to the author's clinic on account of her mental condition. She was disoriented and memory and judgment were much impaired. On April 11th without any premonitory symptoms had a series of 12 epileptic attacks in 24 hours; on May 2 another series of 15 attacks in 24 hours and on May 31 still another of 43 attacks in 24 hours. The last series showed the typical picture of status epilepticus of the left half of the body. On percussion of the skull the tone was higher on the right than on the left; a tuning fork continued sounding much longer on the right than on the left. From the preceding trauma, the hallucinatory condition developing a few weeks later, followed by this epileptic picture a hematoma was suspected and operation advised. The site of the hematoma was indicated by the mode of beginning of the attacks. They were introduced by respiratory spasm, the eyes and head turned to the left and the spasm appeared first in the flexors and extensors of the left arm. A roentgenogram was made and between the suggested trephine lines there was an area showing whitish spots, indicating that the rays penetrated better here. These spots are not seen in the normal roentgenogram and are not nearly so clear in the plate made after operation.

The two anterior frontal convolutions and the gyrus precentralis were exposed, and on opening the dura mater fresh blood flowed out. The hematoma consisted of three layers—the fresh blood that ran out when the dura was opened, not more than a few days old, a layer in which organization had already taken place, probably about 4 weeks old, and one in which organization had proceeded still further, about two months old. After the operation the patient was as well physically and mentally as she had been before the injury. She still showed the psychic equivalents of epilepsy.

The author does not know just why the hematoma caused the roentgen appearance described, but suggests as a possible explanation that the stripes and spots were due to the different degrees of organization of the blood clot. The fact that they disappeared so quickly after operation argues for this explanation. But at any rate the case is interesting as showing that the roentgen rays may be used as an aid in diagnosing subdural hematoma.

A plate is given showing the roentgen appearances before and after operation and a histological picture of the hematoma.

CHILAIDITI: Radiotherapy of Inoperable Cancer of the Breast. (*Grèce Médicale*, Athens, 1916 XVIII, p. 9. Ref.: *Jour. Am. Med. Assn.*, Oct. 16, 1916, Vol. LXVII, p. 1090.)

In Chilaiditi's case the cancer had developed rapidly in the sixth month of a pregnancy. The tumor had infiltrated the breast, which was hard, as also the enlarged lymph glands in the axilla and supraclavicular and subclavicular regions, with other small nodules in the skin, and there was great emaciation. The findings in the mediastinum were also suspicious. The tumor retrogressed completely under intensive cross-fire exposure to the roentgen rays. Three series of treatments were given, the last following the birth of the healthy child. During the five months since the beginning of treatment there has been no sign of recurrence, all traces of the tumor had definitely subsided by the fourth week after

the second series of exposures. To obtain the total dose of 600 H, after filtering through 4 mm. aluminum plus 5 mm. leather, the production of 4,000 H was necessary.

PETIT, HENRI: Red Light as an Aid in Operating under Fluorescent Screen Guidance (Extraction rapide des projectiles de guerre par le chirurgien seul à l'aide de la lumière rouge et des repérages successifs sur l'écran radioscopique). (*Paris méd.*, 1916, vi, 76.)

It is impossib e in the field to use the complicated geometrical methods of locating foreign bodies. The simplest thing to do would seem to be to look for them under the guidance of the fluoroscopic screen. But there are two grave difficulties about this—the danger of roentgen dermatitis for patient and surgeon and the impossibility of the eye accommodating itself at once to the change from normal light to the roentgen light. The danger of dermatitis is overcome by reducing the bundle of rays as much as possible and also reducing the time of exposure. The rays are reduced by surrounding the tube with a zinc box two millimeters thick with an opening in the upper part the size of the maximum opening of the diaphragm. Movable plates of lead are arranged so as to slide over this opening and reduce it to the smallest size possible in each individual case. A square of about 5 cm. on each side is generally sufficient, showing the projectile and the end of the instruments, but leaving the hands of the surgeon protected. To avoid continuous exposure during the operation the roentgen rays are thrown on the wound for only an instant and the location of the projectile marked on the skin; then the rays are shut off and the surgeon proceeds until he finds it necessary to use them again, just as the pilot looks at his compass for only an instant to get his direction. During the whole operation the operator has been exposed to the rays only a few moments. To overcome the other difficulty—the impossibility of the eye to accommodate itself to the change in light for several minutes—it is only necessary to use red light, for the eye accommodates at once in passing from red light to fluorescent light. The light can be as intense as desired, if it is red. To get intense light on the field of operation a forehead light may be used fastened on with an ordinary mirror band.

As soon as the patient is on the table the tube is turned on and the diaphragm arranged so as to expose a square of about 5 cm. As soon as the foreign body is located a pair of forceps is placed on each side of it to mark its place. The rays are then shut off and the surgeon incises in the spot marked, following the direction indicated by the anatomy of the region. If the body is not found, a retractor is placed on each edge of the wound, and the tip of a cannulated sound laid in the wound; the rays are turned on again and an assistant pulls on one of the retractors to bring the projectile into the middle of the wound and the surgeon pushes in the sound until it touches the projectile; when the rays are turned off, he proceeds to extract it. These two exposures are generally all that are necessary, but sometimes one may need four. But the surgeon is sure of finding the projectile. This method is much superior to having a roentgenologist locate the foreign body and the surgeon extract it. The surgeon can use much greater precision if he sees the body himself; and the only way to accomplish this without undue exposure is by the use of red light. This may be very simply procured by putting over ordinary electric bulbs the red paper which is used to protect photographic papers.

HAMBURGER, WALTER W.: The Modern Medical Treatment of Chronic Ulcer of the Stomach and Duodenum. (*Medical Clinics of Chicago*, Vol. 2, No. 3, Nov., 1916, p. 419.)

From a somewhat optimistic report on the medical treatment of a gastric ulcer case we abstract the following particulars.

A 36-year-old tea taster had suffered for five years from periodical pains after meals, vomiting, sour, acid eructations and burning throat pains. There was loss of weight and, on careful study, a trace of occult blood was found on one occasion. Thus the history was extremely suggestive of gastric or duodenal ulcer which was supported by the other clinical findings.

Repeated roentgen examinations showed a slight hypersecretion, pylorospasm, motility six hours, hyperperistalsis and a Haudek niche on the lesser curvature. Diagnosis: Chronic penetrating ulcer of the lesser curvature.

As the patient was afraid of the knife, a tentative medical treatment was instituted on

the understanding that surgery would be resorted to in the event of unfavorable results. After five weeks' dieting and small doses of alkali, the patient showed general clinical improvement, had gained in weight and was free from symptoms. He was accordingly discharged. Three months later a roentgen examination, made on suspicion of a recurrence, showed that not only had the ulcer and Haudek's niche completely disappeared, but that there was even a slight convexity at the site of the original ulcer.

It is these findings which greatly astonished Dr. Hamburger and led him to establish this method of treatment as a routine in his clinic. The fact, however, should not be overlooked that such cases are notorious for periods of remission of symptoms, and while it is a thoroughly commendable procedure to avoid surgery if possible, the institution of this "modern medical treatment" as a routine measure for the cure of chronic penetrating gastric ulcer and the interpretation of the absence of roentgenological symptoms as evidence of a cure is too optimistic a proposition to be generally subscribed to. Repeated roentgen examinations as controls, which Dr. Hamburger advocates, are no doubt highly desirable, especially as they may and very often will reveal persistence of the disease, malignant degeneration or the development of a carcinoma on the site of the old ulcer, even after the lapse of several years.

In regard to Dr. Hamburger's terminology, it would be advisable in the description of roentgen examinations to distinguish between roentgenoscopy, *i.e.*, screen observations, and roentgenography or photographic reproduction on a plate or film. Incidentally it may be remarked in connection with the subject of terminology, that the expressions radiology, radioscopy and radiography give rise to confusion with radium examination and treatment, and should therefore not be used indiscriminately.

FREUD, JOSEPH: Roentgen Examination of Gastro-enterostomized Patients with the Aid of the Duodenal Sound. (*Muench. med. Wchnschr.*, Vol. 63, No. 41, Oct. 10, 1916, p. 1447.)

Freud, who is an assistant physician in Holzknecht's Roentgen Laboratory in Vienna, describes the difficulties encountered by the roentgenologist if a patient with a gastro-enterostomy is again troubled with gastro-intestinal irregularities at a later period in his life. He shows that it is a mere matter of accident whether the customary method of bismuth investigation will or will not reveal the permeability of the gastro-enterostomy; and, furthermore, that this method is quite unsuitable to establish the presence of a peptic jejunal ulcer, because it can not determine the seat of the fistula or visualize the gastro-enterostomy loops. For the same reason it furnishes no information on the position of the gastro-enterostomy in relation to the deepest point of the greater curvature. The chemical and motor investigations of the gastric contents in these cases have so far failed to furnish uniform data from which any reliable opinion on the function of the gastro-enterostomy could be formed. The author, therefore, comments on the necessity of a method by which the above points can be decided not only in the interests of the individual patient, but also in regard to the value of gastro-enterostomy as a method of cure in gastric ulcer.

He has found such a method in the use of the duodenal tube, and although he has used this aid from the beginning of 1915 he has delayed communicating the roentgen findings for the reason that he wished to present a number of re-laparotomized cases as an ocular demonstration of the correctness of the findings. Among the eighty cases so far examined there has not been sufficient operative material to base a report upon, but he has received reports of ten re-laparotomies in six of which a peptic ulcer of the jejunum was found in accordance with the roentgen findings. He therefore publishes his method now in the shape of a preliminary communication, as he feels the justification of its general employment. He explains:

With the aid of the duodenal tube it may be positively decided

(1) whether the gastro-enterostomy is patent or not;

(2) the lumen of the anastomosis, if permeable;

(3) the seat of the anastomosis;

(4) the position of the anastomosis in relation to the lowest point of the greater curvature;

(5) circumscribed susceptibility to pressure, if any, and the location of the anastomosis loop;

(6) the presence or absence of a pressure point in the anastomosis loop;

(7) the possible retention of a small sedimented barium mass in a peptic ulcer of the anastomosis or its loop;

(8) the possible disturbance of the position or mobility of the loop by adhesions;

(9) whether a pressure point at any part of the stomach, pointing to recurrent ulcer, lies outside the anastomosis.

His method of examination is as follows: The duodenal sound is introduced to the 45 cm. mark in the usual manner. The patient, in the erect position, swallows it further down under the control of the roentgen screen. As soon as the sound has passed the fistula, it is allowed to wander as low as possible in the anastomosis loop, until it arrives at a point where it is arrested, causing vomiting (ileus manifestations) on forced swallowing. The olive is then pulled back into the stomach in the endeavor to observe whether it will enter another intestinal loop especially when forced away from the first loop. The anastomosis loop is now filled with barium through the sound, observation being made as to the form, filling and motor conditions of the loop, and at the same time paying attention to whether it is diffusely or locally susceptible to pressure. The observation is continued until the loop is completely evacuated in order to verify the possible occurrence of a small barium speck. The fistular ring is examined for circumscribed or diffuse susceptibility to pressure. A small quantity of opaque substance is deposited at the fistular ring in order to see whether any portion of it is retained in a niche and whether, as the olive is withdrawn, there is a perceptible resistance or pain as the fistula is passed. If the olive has not passed the fistula after repeated attempts, and if the pylorus is open, the olive is allowed to wander as deeply as possible into the duodenum in the usual way, after which the opaque substance is injected into the duodenum; if the fistula is permeable, the barium will return into the stomach through the fistula. The anastomosis loop is then filled.

LICHTENHAHN, F.: Favorable Effect of Roentgen Treatment in a Case of Gangrene of the Lung. (*Roentgen-Taschenbuch*, 1915. Ref. *Zentralbl. f. Roentgenstr.*, 1916, Nos. 5 and 6, p. 169.)

In the case described by the author, a lower lobe of the lung had become affected with gangrene. The affection had already existed for eighteen months and been operated upon. Application of the roentgen rays caused a considerable reduction in the secretion, but the treatment had to be interrupted for personal reasons. In the course of three months the author applied 12 Sabouraud doses with an 11-Wehnelt tube.

DIETRICH, W. C.: Roentgen Therapy in Tuberculosis of Bones and Joints. (*Strahlen-therapie*, 1915, Vol. 6, No. 14. Ref. *Zentralbl. f. Roentgenstr.*, 1916, Nos. 5 and 6, p. 169.)

This report comprises 95 cases of a variety of joints which give Dietrich occasion to summarize his experience as follows: Roentgen therapy is suitable for the treatment of tuberculosis of the bones and joints. Tuberculosis of the capsular ligaments and tendon sheaths lends itself to treatment unless the affection is too far advanced. Even in multiple bone affections tuberculosis of small and medium articulations and bones may be favorably influenced or even cured, as long as the organism is still capable of furnishing the necessary protective substances. Pronounced disintegration of bone must be removed before treatment commences. Roentgen therapy is also to be commended for post-operative treatment combined, if possible, with sun and air baths and with injections of old-tuberculin or a bacillary emulsion.

FRAENKEL, M.: Analgesic Effect of Roentgen Treatment in Various Affections. (*Med. Klin.*, 1916, No. 15. Ref. *Zentralbl. f. Roentgenstr.*, 1916, Nos. 5 and 6, p. 171.)

It has often been observed in the roentgen treatment of a number of affections, such as myoma, dysmenorrhea and leukemia, that a welcome by-effect consisted in the alleviation of pains. Fraenkel has made distinct observations to this effect in the roentgen treatment of pulmonary tuberculosis and also during the healing process of fractures where the roentgen rays were applied to observe the incitement to bone growth. The same result was observed in extensive blood effusions. The author briefly describes two further cases: one of inflammation of the gallbladder where the author himself was the patient, and the other a case of severe sciatica on the left side in an army officer.

Two or three applications are usually sufficient to procure the desired effect.

HUESSY, PAUL, and WALLART, J.: Interstitial Gland and Roentgen Castration. (*Ztschr. f. Geburtsh. u. Gyn.*, 1915, Vol. 77, No. 1. Ref. *Zentralbl. f. Roentgenstr.*, 1916, Nos. 5 and 6, p. 171.)

1. Roentgen rays have an elective destructive effect upon the follicular apparatus of the ovaries, although a few primary follicles may escape degeneration and remain intact.

2. The interstitial gland is not only not impaired but seems to actually undergo hypertrophy.

3. Consequently, the roentgen treatment of myomata does not mean simple castration, *i.e.*, annihilation of the ovarian parenchyma. This may perhaps explain the absent manifestations observed by several authors.

4. The principal destructive effects in the endometrium are shown in the vessels. But it is questionable whether these are due to the roentgen rays considering the experience of older authors gathered in the operation of castration, and also the observations of Pankow and others on physiological sclerosis in menstruation.

5. Recurrences after roentgen treatment can not be positively excluded, because with the precautions of modern technic there is no certainty that all the follicles have been destroyed in each case. The recurrences are to be regarded as belonging to the follicles.

ARNOLD: Blood Changes in Deep Roentgen Treatment of Malignant Tumors. (*Muench. med. Wchnschr.*, 1916, No. 5. Ref. *Zentralbl. f. Roentgenstr.*, 1916, Nos. 5 and 6, p. 172.)

1. Deep roentgen treatment causes changes in the human organism which can be demonstrated in the blood. The total number of white blood cells undergoes a change, very frequently in the form of hyperleucocytosis which sets in either immediately after the application of the rays or after a certain period of latency. Analogously to the animal experiments of Heineke, there are also changes found in the morphology of the blood picture which are especially evidenced by a decrease of lymphocytes and an increase of neutrophile leucocytes, and occasionally also by the exaggerated occurrence of bone marrow cells.

2. In a general way, repeated applications of roentgen rays produce the same alteration of the leucocyte curve, though to a less pronounced extent. Following a relatively rapid succession of roentgen applications, the total number of leucocytes is frequently observed to undergo a gradual decrease below normal, as an expression of a certain exhaustion of the blood-generating sources.

From these observations the author deduces the following postulates for the practical application of deep roentgen therapy.

a. In repeated intense roentgen applications the number of leucocytes should be under continuous control, or at least before and after each application.

b. The blood picture should be examined before the first roentgen treatment as well as at later periods at certain intervals, in order to determine any pathological changes. Should the total number of leucocytes be below normal (4000) or should pathological manifestations (bone marrow cells) accumulate, it would seem indicated to interrupt the treatment until the blood resumes normal conditions. The author believes this to be the surest way to obviate late injuries attributable to the roentgen rays.

MEYER, FRITZ M.: Roentgen Idiosyncrasy in the Light of Our Present Knowledge. (*Roentgen-Taschenbuch* for 1915, p. 111. Ref. *Zentralbl. f. Roentgenstr.*, 1916, Nos. 5 and 6, p. 173.)

Meyer reports a case where a distinct reaction of the second degree occurred and pigmentation on two occasions after the application of a three-quarter-full-dose to four different parts of the body through a medium constantly running tube which had been carefully tested by the Sabouraud-Noiré method. The patient had not received any previous roentgen treatment. Meyer cites this case as an incontrovertible proof of the oversensitiveness of normal skin to roentgen rays.

PFOERRINGER, S.: Late Roentgen Injuries of the Skin. (*Roentgen-Taschenbuch*, 1915. Ref. *Zentralbl. f. Roentgenstr.*, 1916, Nos. 5 and 6, p. 172.)

Pfoerringer observed a late skin injury following roentgen treatment of tarsal tuberculosis

in a 54-year-old woman. The total dosage in the course of six months consisted of 77 H (154 X), applied through three ports of entry through a 3 mm. aluminum filter. There never appeared a local reaction during the treatment. The tubercular complaint was slowly cured and the foot could be used again. Three months later, an extensive change of the skin set in at both sides and on the dorsal part of the foot. The skin became copper-colored, showed considerable tension and infiltration, and was covered with crusts and thick scales. At one place, very thick horny lamellæ developed. The patient complained of a feeling of tension over the dorsal part of the foot. The trouble increased in spite of treatment and receded only after the prolonged use of baths, oil and lanolin bandages. Finally all traces disappeared, leaving a normal skin. As this skin affection could not be traced to any other cause and besides, developed within the roentgenized area, the author looks upon the case as one of late roentgen effect which developed in spite of the strong filtration.

LEGAL RESPONSIBILITY FOR NEGLIGENCE IN THE APPLICATION OF ROENTGEN RAYS. (*Tägl. Rundschau und Zeitschr. f. aerztl. Fortb.*, 1916, No. 14. Ref. *Zentralbl. f. Roentgenstr.*, 1916, Nos. 5 and 6, p. 173.)

An interesting lawsuit has recently been decided by the German Supreme Court in which the principle of legal responsibility was laid down. The case was as follows:

A locksmith was treated in the clinic of the university at B. for dilatation of the esophagus. One day the patient was presented to the students for purposes of demonstration under roentgenoscopy. The demonstration was unduly prolonged owing to the large number of students who wanted to see the picture. A severe skin burn resulted, and the patient brought an action against the director of the clinic and his assistant, claiming damages for pain money, expense of treatment and loss of work, the total sum being six thousand marks. The defense was that the patient must have had a hypersensitive skin, as otherwise the injury could not have happened. The plaintiff was non-suited in the lower court, but on appeal the judgment was reversed on the following grounds: It was highly probable that unduly prolonged exposure to the rays was the cause of the burn. The defendants ought at least to have taken care that the rays were not continuously directed on the same spot but changed about. They should have known, according to the present state of science, that the sensitiveness of the human skin increases with repeated application of the rays and that the occurrence of a burn depends upon the duration and strength of the applied rays. As experienced clinicians, the defendants should have taken such a contingency into account and done everything to prevent it. The defendants endeavored to have this decision reversed by the Supreme Court, but failed. Judgment dated March 24, 1916.

TRENDELENBURG, WILHELM: Spectacles to Adapt the Eyes to Roentgenoscopy. (*Muench. med. Wchnsch.*, 1916, No. 7. Ref. *Zentralbl. f. Roentgenstr.*, 1916, Nos. 5 and 6, p. 174.)

The desideratum in this respect is to find a device which affects none but the examiner and then only the retinal layer, while at the same time it should be possible for him to perform any kind of work in an ordinarily lighted room. The author claims to have solved this difficulty by inserting a red glass of a carefully selected tint into the frame of automobile spectacles. (Theory of von Kries; manufactured by C. Zeiss, Jena, Germany.)

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BOOK REVIEWS

THE MEDICAL CLINICS OF CHICAGO. Nov., 1916. Vol. II, No. 3. Published Bi-Monthly by W. B. Saunders Company, Philadelphia and London.

We would most earnestly direct attention to the article by Hamburger upon Gastric and Duodenal Ulcer. Hamburger constantly repeats the phrase, "In view of the definite evidence of a pocket upon the lesser curvature," and refers constantly to "the value of repeated fluoroscopic examinations as a control of treatment and as a guide in the healing process." Hamburger brings out the fact (although still doubted by some roentgenologists) that the motor insufficiency of the stomach (delayed emptying time) is of paramount importance.

Roentgenologists cannot escape sharing the diagnostic and prognostic responsibility of the roentgen evidence and therefore the clinical side of cases must be appreciated and understood by the roentgenologist. We know of no more efficient means of gaining clinical understanding than through the clinical lectures reported bimonthly in this publication. Not only the article of Hamburger's but an excellent chapter upon Cardiospasm by Frank Smithies and seven other clinics of various specialities are included in this last issue. E. H. S.

THE CLINICS OF JOHN B. MURPHY, M.D., at Mercy Hospital, Chicago. Edited by P. J. Skillern, Jr., M.D., of Philadelphia. Oct., 1916, Vol. V, No. 5. Published by W. B. Saunders Company, Philadelphia and London.

The posthumous appearance of Doctor Murphy's clinical sessions indicates clearly the capacity and preparedness of this great surgeon. Probably there is sufficient material to bring the present volume to a glorious closing. The variety and the comprehensiveness of Murphy's surgery is well illustrated in this present issue. Think of it! Two hundred and twenty pages under thirty-three titles, and all presented in a most readable style. No exhausting statistics! No lengthy operative descriptions! But crisp, staccato reports of cases, with the surgical wisdom of a lifetime reduced to alluring aphorisms and alliterations. Would that these surgical clinics could have continued forever. Their uniqueness was constantly reflecting the cleverness of the great Murphy—his wonderful ability to teach surgery to the surgical masses. There was always such a genuine American style to Murphy. E. H. S.